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ComhairleChontaeUíbhFhailí

LaoisCountyCouncil
ComhairleChontaeLaoise

LongfordCountyCouncil
ComhairleChontaeLongfoirt

NorthTipperaryCountyCouncil
ComhairleChontaeThiobraidÁrannThuaidh

WestmeathCountyCouncil
ComhairleChontaeNah-Iarmhí

epa
Environmental Protection Agency

Pilot Strategic Environmental Assessment of the Proposed Replacement Midlands Waste Management Plan 2005-2010

ENVIRONMENTAL REPORT

COWI

July 2005

RPS mcos

PREFACE

This Report contains the findings of the Strategic Environmental Assessment of the Proposed Replacement Midlands Waste Management Plan 2005-2010. The Environmental Report contains the detailed and technical information on the assessment findings. A Non Technical Summary has also been produced in association with this Report.

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

CO	Carbon Monoxide
CO_2	Carbon Dioxide (a colourless, odourless, incombustible gas present as a minor constituent of the atmosphere, where it comprises 0.35% by volume)
cSAC	Candidate Special Area of Conservation
CSO	Central Statistics Office
DED	District Electoral Divisions
EPA	Environmental Protection Agency
GIS	Geographical Information System
GSI	Geological Survey of Ireland
Ha	Hectare = 10,000 square metres or 2.47 acres
mbgl	Metres below ground level
m/s	Metres per second
Mg/l	Milligrams per litre
mg/m^3	Milligrams per metre cubed
mm	Millimetres
mm/s	Millimetres per second
NAQS	National Air Quality Standards
NDP	National Development Plan
NHA	Natural Heritage Area
NO_x	Nitrogen Oxides, usually includes the two pollutants nitrogen monoxide and nitrogen dioxide (NO_2) produced by high temperature combustion and some natural processes. Nitrogen dioxide is the most important form which can contribute to adverse health effects, ozone formation and acid deposition
NO_3	A salt of nitric acid (HNO_3)
OPW	Office of Public Works
pH	A measure of the strength of an acid or a base
PM_{10}	Particulate Matter (fine airborne particles) less than 10 micrometers in diameter
pNHA	Proposed Natural Heritage Area
ppb	Parts per billion

ppm	Parts per million
RMP	Record of Monuments and Places
SAC	Special Area of Conservation
SO_2	Sulphur Dioxide
SPA	Special Protection Area
µg/l	Micro-grams per litre
µg/m^3	Micro-grams per metre cubed
VOC	Volatile Organic Compounds (a compound which evaporate readily and contribute to air pollution mainly through the production of secondary pollutants such as ozone)

1 INTRODUCTION

1.1 BACKGROUND

This is the Environmental Report containing the findings of a Pilot Strategic Environmental Assessment (SEA) of the Waste Management Plan for the Midlands Region for 2005-2010. The Midlands Local Authorities were invited by the Department of Environment, Heritage and Local Government (DoEHLG) to pilot the SEA process in tandem with its review of the 1999- 2004 Midlands Waste Plan. The SEA is being carried out with funding from the Environmental Protection Agency (EPA) and under their guidance. It's purpose is to pilot the process on waste management plans so that methodologies can be refined for future use. This is on a non-statutory basis as the review of the Waste Plan commenced before SEA legislation was enacted.

The first Waste Management Plan for the Midlands Region was adopted in 2001 on behalf of the Midlands Local Authorities (Offaly Co. Co., Laois Co. Co., Westmeath Co. Co., Longford Co. Co. and Tipperary North Co. Co.). This Plan has been reviewed and a Proposed Replacement Plan has been prepared for the period 2005- 2010. The aim of the Waste Plan is to set out the framework for the sustainable management of waste in the Region. It covers all non-hazardous waste arising in the region and includes guidance on the management of hazardous waste in accordance with the National Hazardous Waste Management Plan (EPA, 2001). The contracting authority is Offaly County Council.

This Report documents the assessment carried out on the Waste Plan. The EPA document "Development of Strategic Environmental Assessment (SEA) Methodologies for Plans and Programmes in Ireland, Synthesis Report, EPA (2003) has been used as guidance in the process.

1.2 STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

Strategic Environmental Assessment (SEA) is defined as *'the formal, systematic and comprehensive process of evaluating the effects of a proposed policy, plan or programme or its alternatives, including the written report on the findings of that evaluation, and using the findings in publicly accountable decision making'* (Thérivel *et al*., 1992).

SEA is a process for evaluating at the earliest appropriate stage, the environmental quality, and consequences, of policies, plans or programmes and to ensure that any consequences are assessed during their preparation and before they are adopted. Its overall purpose is also to contribute to sustainable development. It also gives the public and other interested parties an opportunity to comment and to be kept informed on decisions that may impact on the environment and how they were made. **Figure 1.1** shows an overview of the SEA process.

The European Directive on SEA (2001/42/EC) was adopted into Irish Legislation on the 21st of July 2004 by the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations, S.I. No. 435 of 2004. Certain plans and programmes prepared by statutory bodies and which are likely to have a significant impact on the environment will now require an SEA to be carried out, where the preparation of such plans and programmes is started after that date.

The SEA process includes the following outputs:

- An Environmental Report (a report containing the findings of the SEA) on the likely significant effects of the Proposed Replacement Waste Plan.
- Consultation on the Proposed Replacement Waste Plan and the Environmental Report.

- An SEA Statement (identifying how environmental considerations and consultation have been integrated into the Waste Management Plan for the next 5 years).

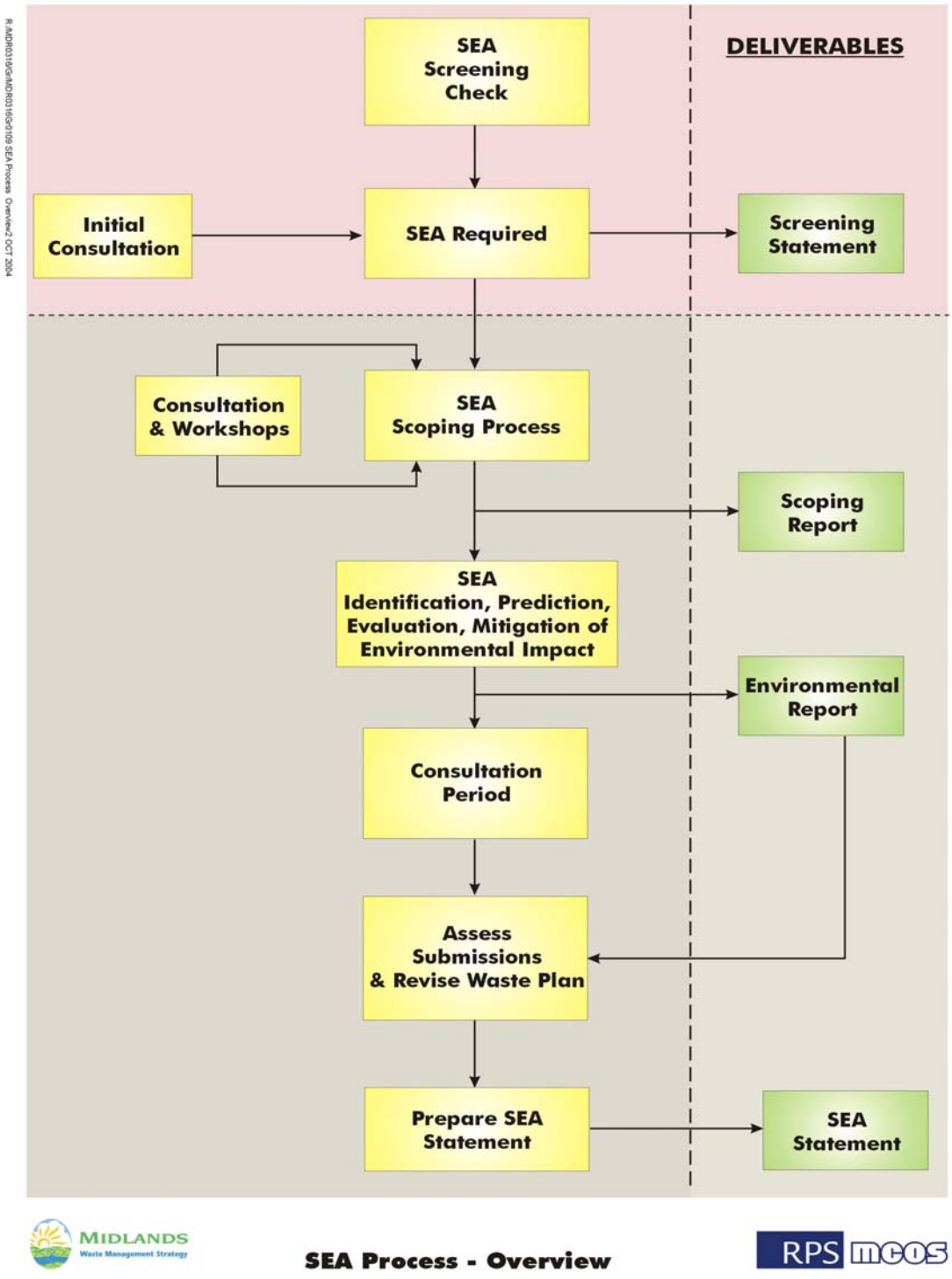

Figure 1.1: Overview of SEA Process *(Source: RPS MCOS)*

1.3 CONTENTS OF ENVIRONMENTAL REPORT

The following is the information contained in the Environmental Report as per Article 12 (1) and Schedule 2 of the SEA Regulations:

Chapter 3: Replacement Midlands Waste Management Plan, Context and Summary

This section gives an overview of the Waste Plan, its context in relation to National and EU Waste Policy, extent of the Plan, objectives, current waste generation and progress since the previous Waste Plan.

Chapter 4: Baseline Environment (Current State of the Environment)

The current environmental conditions of the area likely to be affected by the Plan are established for each aspect of the environment (biodiversity/flora and fauna, water, air/climatic factors, soils/landuse, cultural heritage, landscape, material assets, population, health, energy, and transport).

Chapter 5: Key Environmental Issues and Problems in the Region and Evolution of the Environment without the Plan.

The key environmental issues / problems in the Midlands area are identified based on the review of the baseline data. Also included are policies and objectives in the Plan that will aim to address these environmental problems.

Chapter 6: Objectives, Targets and Indicators

Environmental objectives have been identified for biodiversity/flora and fauna, water, air/climatic factors, soils/landuse, cultural heritage, landscape, material assets, population, health, energy, and transport**.** These are consistent with relevant international, EU and national environmental policy. Targets and indicators have also been set for achieving these objectives.

Chapter 7: Assessment Methodology

The Waste Plan policies are assessed against the environmental objectives as above. The method uses a matrix format where policies are considered to have a positive, negative, neutral or uncertain impact on the environment.

Chapter 8: Assessment of Alternatives and selection of Best Practicable Environmental Option (BPEO)

This section describes identified scenarios (alternatives) for managing waste in the Midlands region, the assessment of the impacts of each alternative, and the reasons for the chosen scenario i.e. the Best Practicable Environmental Option (BPEO). The selected option was identified in the Midlands Waste Management Strategy (1998) and is the basis on which the waste management policies for the region are set for the next five years and in the longer term.

Chapter 9: Assessment of Impacts of the Plan

This is where the likely significant effects of each of the Waste Plan policies on the environment are assessed. Measures are also proposed to mitigate likely significant impacts due to

implementation of the Plan. Measures include proposed siting criteria for waste management facilities.

Chapter 10: Proposals for Monitoring

The significant environmental effects of the Plan on the environment must be monitored. Proposals for monitoring are included in this section.

Chapter 11: Conclusions and Recommendations

Conclusions are drawn on the broad findings of the assessment and Environmental Report and Recommendations are made.

1.4 LEVEL OF DETAIL OF THE SEA

The level of detail contained in the SEA is determined by:

- The location of the Waste Plan in the planning and decision-making hierarchy and the level of detail of the policies within the Plan. The scope and level of influence of the Waste Plan is to a certain degree predetermined by other objectives, plans and strategies (see **Figure 1.2**);
- The degree to which the Plan determines an environmental impact;
- The availability of existing data when the SEA is being prepared.

A constraining factor in terms of this SEA is the level of detail of the policies. Site-specific policies have not been recommended thus influencing the level of assessment that can be undertaken.

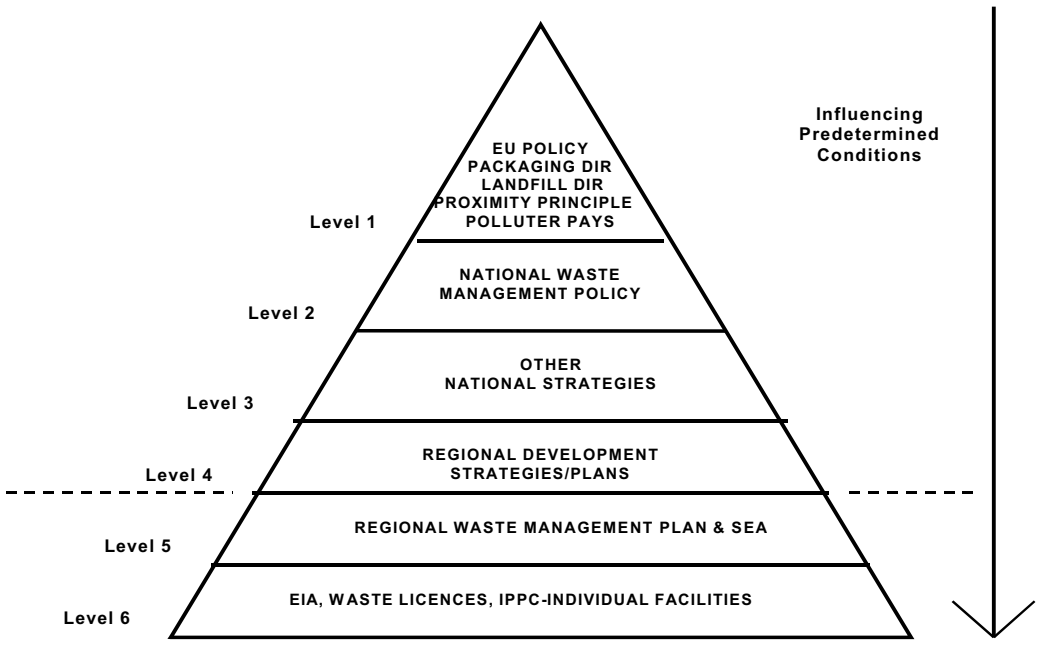

Figure 1.2: Levels at which Decisions are Taken in relation to the Waste Plan

(Source: RPS MCOS)

1.5 WASTE STREAMS ADDRESSED IN THE PLAN

While the Waste Management (Planning) Regulations 1997, require that Waste Management Plans quantify the arisings from 15 waste streams, the initial Waste Plan focused on waste reduction programmes and waste infrastructure to collect, recycle and dispose of household, commercial and industrial wastes. The 2001 Plan reflected the emphasis of government policies on these areas. The 2005- 2010 Plan has focused on the following key waste streams:

- Municipal (household and commercial) waste arisings
- Household waste (including household hazardous materials)
- Commercial/ Industrial (including Industrial sludges)
- Construction and Demolition
- Waste Electrical and Electronic Equipment (WEEE)
- Packaging Waste
- Special Waste streams –Non-hazardous healthcare waste, contaminated soils, ash and incinerator waste residue, Litter and street sweepings, End of Life Vehicles.

The Plan covers non-hazardous wastes arising. The Plan also has regard to the management of hazardous waste in accordance with the National Hazardous Waste Management Plan, prepared by the EPA. In general agricultural wastes are not dealt in any detail with in the Waste Plan and therefore are not dealt with by the SEA, however Government policy has been referred to.

2 METHODOLOGY

2.1 INTRODUCTION

The methodology reflects the requirements of the SEA Directive and transposed Irish Regulations. The EPA document "Development of Strategic Environmental Assessment (SEA) Methodologies for Plans and Programmes in Ireland, Synthesis Report, EPA (2003) has also been used as guidance during preparation of this Environmental Report. The EPA Document also contains an SEA Checklist, which has been used during the SEA process. Experience was also drawn from other SEA's carried out in Ireland and the UK. The methodology involves the following main stages:

- Scoping on the extent and level of detail of the Environmental Report;
- Establish current environmental conditions (baseline).
- Set out alternatives considered, and reasons for selection of the preferred option;
- Assessment of stages of the waste hierarchy and assessment of policies in the Waste Plan.

Future stages of the process to be carried out are:

- Consultation on the Plan and Environmental Report and production of the SEA Statement;
- Monitoring the environmental impacts of the Waste Plan.

2.2 AUTHORS

The Environmental Report has been prepared by environmental scientists and waste management engineers in RPS-MCOS in conjunction with SEA and waste management experts in COWI (Denmark) under the guidance of the EPA. In addition, input and advice was received from The Department of the Environment, Heritage and Local Government (DoEHLG) and The Department of Communications, Marine and Natural Resources (DoCMNR) and the Midlands Local Authority personnel.

2.3 TIMESCALE

The Waste Management Plan Review commenced in June 2004, which was before SEA legislation was enacted in Ireland on the 21st of July 2004. Therefore this SEA is non- statutory. The Scoping and Environmental Report (containing the assessment of the Plan) were carried out in tandem with development of the Plan and the timescale was determined by the timescale of the Plan.

2.4 SCOPING AND CONSULTATION

Under SEA legislation, designated environmental authorities must be consulted in relation to the scope and level of detail to be included in the Environmental Report. Scoping is carried out to ensure that key environmental issues are addressed at an early stage of the assessment and Plan preparation.

The following authorities are identified as Environmental Authorities in the SEA Regulations; The Environmental Protection Agency (EPA); The Department of the Environment, Heritage and Local Government (DoEHLG) and The Department of Communications, Marine and Natural Resources (DoCMNR).

As part of the scoping process a workshop was held on 3rd November 2004 to discuss the SEA scope and level of detail, methodology, and environmental objectives, indicators and targets. The workshop was attended by members of the SEA study team, the Waste Plan team, the environmental authorities and the local authorities. Following this a Scoping Report was circulated to participants. Comments received were taken into account for the Environmental Report. The Environment and Heritage Service Northern Ireland were also consulted.

As part of the Waste Plan Review, extensive consultation was carried out during the period June to December 2004 using a number of methods. The issues raised have been considered in the development of the Proposed Replacement Plan 2005-2010 and the SEA Environmental Report.

A further two-month period of consultation shall be undertaken on publication of the Proposed Replacement Waste Plan and Environmental Report. Following the public consultation period, and the incorporation of any amendments, the Plan will become the Statutory Waste Management Plan for the Region for the period 2005-2010.

The outcome of this public consultation will also be taken into account in an SEA Statement (identifying how environmental considerations have been integrated into the Plan), which will be produced with the Final Plan.

3 MIDLANDS WASTE MANAGEMENT PLAN, CONTEXT AND SUMMARY

3.1 INTRODUCTION

In line with legislation, a review of the Midlands Waste Management Plan covering the period 1999-2004 has been undertaken. A Proposed Replacement Waste Management Plan has been prepared to cover the proposed period 2005-2010. This chapter gives an overview of national waste management policy, summarises the Waste Plan, examines progress since the previous Plan and details the specific waste policies of the Plan. The extent of the Midlands region and the Plan Area is shown in **Figure 3.1.**

The role of the Waste Management Plan is to set out the framework for the sustainable management of waste in the region. It covers all non-hazardous waste arising in the region and includes guidance on the management of hazardous waste in accordance with the National Hazardous Waste Management Plan (EPA, 2001). The Plan Review addresses all aspects of waste minimisation, collection, transport, recovery including recycling, treatment and disposal. It includes a review of the progress against objectives set in the previous Plan.

In 1998 the Midlands Local Authorities joined together to prepare the Midlands Waste Management Strategy Study, which set out the framework for informed decision-making on appropriate management of waste over the next 20 years. Very ambitious targets were set out and remain for the management of waste, including:

- Recycling 46%
- Thermal treatment 37%
- Landfill disposal 17%

Current policy in the region is based on the Midlands Waste Management Strategy (1998), Midlands Waste Management Plan (1999), a review of EU and National policies, strategies and legislation in the intervening period, and the performance of the region since 1999.

3.2 WASTE MANAGEMENT POLICY AND LEGISLATION

The Government approach to waste management was set out in the document “Changing Our Ways”, 1998, which has as its aim reducing our national dependence on landfill by encouraging the transition to a modernised integrated waste system, in accordance with the European Waste Hierarchy **Figure 3.2** i.e.

- The prevention and minimisation of waste
- The recovery of waste by reuse and recycling
- The recovery of waste as a source of energy
- The safe disposal of wastes, which cannot be prevented, recycled or recovered.

Project	*Midlands Waste Plan*	Figure	3.1
Title	**Location Map**		

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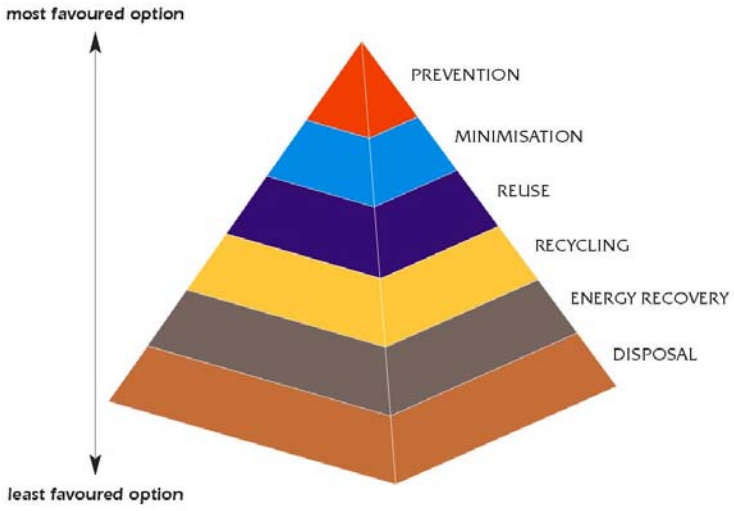


Figure 3.2: EU Waste Management Hierarchy

(Source: Waste Framework Directive, 1975 (75/442/EEC))

National targets were set out in this policy statement, to be realised over a period of 15 years from 1998 in order to fulfil the country's obligations under EU legislation. Other policy documents include 'Delivering Change, 2002, and 'Taking Stock and Moving Forward' 2004. In addition to National Policy the EU Landfill Directive imposes very strict legal conditions on what can be landfilled in the future. The provision of alternative facilities for treatment of wastes such as biodegradable wastes remains a priority.

3.3 EXTENT OF WASTE PLAN REVIEW

The first Midlands Waste Management Plan (2001) was based on the Midlands Waste Management Strategy Study, a 15-20 year strategy for the Region, founded on an integrated approach to waste management. As part of the Waste Strategy Report (1999) an environmental and modelling assessment was carried out which allowed environmental and economic comparisons of future waste management options to be considered.

Three integrated waste scenarios were identified and compared to determine the preferred option or Best Practicable Option (BPEO) for waste management in the Midlands. These scenarios represented a combination of different recycling targets with the possible introduction of thermal treatment with energy recovery and landfilling of non-combustible residues. As not all waste is recyclable and it is not possible to achieve 100% sorting efficiency, bulk reduction methods such as thermal treatment had to be considered. The scenarios were as follows:

- ***Scenario 1:*** *Achieve maximum realistic recycling, continue with landfill disposal.*
- ***Scenario 2:*** *Achieve national and EU targets for recycling and introduce thermal treatment of combustible wastes.*
- ***Scenario 3:*** *Achieve maximum landfill diversion through implementation of maximum recycling and the introduction of thermal treatment of combustible wastes.*

From modelling it was concluded that Scenario 3 was the Best Practicable Environmental Option (BPEO) and is the basis for waste policy in the Midlands. The assessment was based on waste flows, environmental and economic impacts with diversion of waste from landfill as a primary objective.

It is not intended to change this overall policy for the Replacement Plan as National and EU waste management policy has not changed significantly in the intervening period since the publication of the original Waste Plan. However outputs or the method of reaching waste targets may change due to new approaches/technologies, e.g. mechanical biological treatment (MBT).

Also the recent emphasis in National policy on Prevention/minimisation, reuse and recycling as exemplified by the "Race Against Waste" national campaign (Reduce, Reuse, Recycle) is acknowledged and relevant polices have been included in the Replacement Waste Plan 2005- 2010.

3.4 PROGRESS SINCE THE PREVIOUS WASTE PLAN (2001)

3.4.1 Waste Prevention/Minimisation

Since the first Midlands Plan in 2001, waste arisings have continued to grow in the Region reflecting the National trend. Figures suggest that waste generation has risen by 14% (2.83% per year) in the last 5 years. Since then, the reporting and recording mechanisms have improved significantly, particularly for household, commercial and construction and demolition (C/D) wastes. Nevertheless nationally, there remains a lack of consistent data and poor reporting systems for specific waste streams such as industrial wastes, sludges and priority waste streams.

In relation to Waste Prevention and Minimisation no targets were set for in the previous Waste Plan and progress over its life span has been slow. Waste prevention practices have not been implemented on a region wide scale. An Environmental Awareness Officer (EAO) has been appointed in each Local Authority, to raise awareness on prevention, minimisation and recycling among the general public in relation to household waste. With regard to commercial waste little progress was made in targeting producers. Most interactions are now through enforcement of packaging regulations and in relation to the issuing of waste permits.

3.4.2 Recovery by Reuse and Recycling

For reuse, waste repair/ reuse centres were recommended in the previous plan but these have not been provided. No specific targets or policies were set and no progress on reuse initiatives was reported on.

In relation to recycling the current situation compared to the 2001 Plan targets is as follows:

- 174 Bring Banks (for collection of glass, cans etc): More than 187 had been provided by the end of 2004.

- 12 Civic Amenity Facilities (accepting the majority of household recyclable wastes): 8 Facilities currently in operation, with a number of additional facilities at varying stages of development

- 1 Biological Treatment Facility: Currently, no facility has been provided although there is private sector interest in developing up to 3 such facilities.

- 1 Central Materials Recovery Facility (MRF) and 2 Transfer Stations: Currently 3 privately operated MRFs service the Midlands.

The overall target for the Region was and still is to achieve 46% recycling by 2013. In the last 5 years recycling infrastructure has continued to expand promoting and increasing recycling and recovery in the household waste stream. Although figures show an increase in recycling (10% of household waste recycled in 2003), there has also been an increase in population and waste generation.

In the commercial sector, source separation and collection of recyclables have developed contributing to an improved recycling system. Recovery is estimated at 37% and it is assumed that the majority of this waste is exported for recycling abroad. There is no data available on industrial wastes.

Recycling here refers only to the collection of material for recycling and not the actual recycling process. As far as can be determined, there are no recycling processing facilities for materials in Ireland with the exception of C/D waste and an oil recycling facility. The majority of materials are exported for processing abroad.

There remains a lack of development in treating biodegradable and construction and demolition (C/D) waste. These need to be addressed if the 46% recycling target is to be achieved. There are no large-scale C/D reprocessing facilities in the Region. C/D waste accepted at landfills is primarily used for landfill cover or internal roads and less than 50% of C/D waste generated in the Midlands is used in this manner. There are also likely to be large quantities of C/D waste 'recovered under permit'.

In relation to biodegradable waste the Biological Treatment Facility included in the original Plan has not been built. Less than 1000 tonnes of organic waste is recycled by home composting, where the compost is used as a soil conditioner.

3.4.3 Landfill

At present there are 4 EPA licenced Local Authority landfills in operation in the Region.

- Ballydonagh (Westmeath County Council)
- Kyletalesha (Laois County Council)
- Ballaghveny (North Tipperary County Council)
- Derryclure (Offaly County Council)

Landfilling remains the primary disposal option for waste in the Region with over 60% of household, commercial and industrial waste streams disposed of to landfill. In response to the slow development of other treatment facilities all 4 landfills have applied to the EPA for extensions to current facilities. In the last five years, controls have been put on the acceptance of types of material accepted at landfill facilities.

The total household waste landfilled in 2003 represents 76% of the total household waste arising in 2003. The dramatic increase in the cost of landfill has encouraged the private sector to seek alternative treatment outlets. The quantity of mixed commercial waste landfilled in the Region in 2003 has decreased since 1998 and represents 43% of the total collected commercial and industrial arisings. It is estimated that there is a remaining capacity of 1.2M tonnes in the region, which would represent approximately 5-10 years of capacity.

Landfill gate fees have escalated steeply in the last five years reflecting operational and management costs. These fees are likely to decrease with the development of alternative waste facilities e.g. biological treatment.

3.4.4 Thermal Treatment

At present, there is no infrastructure within the region for the recovery of energy from waste. The previous plan recommended the provision of a thermal treatment plant with a capacity of 100,000-150,000 tonnes of waste, but little progress has been made in procuring this facility.

3.4.5 Regulation and Enforcement

For the most part, household and commercial waste collection in the Midlands Region is undertaken by the private sector. The Local Authorities are now responsible for ensuring the activities of waste management companies and all waste producers are within the law and in keeping with the goals of the Plan. Dedicated regulation and enforcement units have been established by each Local Authority and the degree of compliance is improving. In relation to cost recovery for waste management, waste collection charges (pay by weight) have recently been introduced.

3.4.6 Uncollected Waste/ Inter-regional movement

The movement of waste into and out of the Region is difficult to quantify as most of the waste generated is collected and managed by the private sector. The sector comprises a mix of local, regional and national collectors and waste can often be transported across regional boundaries for treatment or disposal. **Table 3.1** details the quantities arising, and recorded by Local Authorities in 2003.

In relation to uncollected waste, about 29% of the total household waste disposed of to landfill is uncollected waste and is brought for disposal directly by householders. The growth in uncollected household waste reflects the unwillingness of householders to pay increasing waste charges for waste collection.

3.5 CURRENT WASTE GENERATION

Since the adoption of the first Midlands Waste Management Plan in 2001, waste arisings have continued to grow in the Region reflecting the National trend. Reporting has improved significantly, particularly for household, commercial and construction and demolition (C/D) waste streams. However, there remains a lack of consistent data and poor reporting for industrial wastes, sludges and priority waste streams. **Table 5.1** lists estimates of the key waste categories and quantities arising in the Midlands Region for the year ended 2003.

Table 3.1: Current Quantities of Waste Arisings in the Midlands Region (2003)

Waste Type	Quantity (Tonnes/ Yr)	Source
Household (Collected and Uncollected)	113,550	*Local Authority EPA National Waste Database Returns 2003* *Waste Collectors Annual Environmental Reports (AERs)* *Waste Licensed Facilities AERs*
Commercial waste.	63,996	
Industrial waste	24,758* 251,570**	** Local Authority EPA National Waste Database Returns 2003* ***Estimate using NACE Codes and EPA Factors and based on no. employees sourced from Kompass Business Directory*
Construction and Demolition (C/D) waste.	265,000	*Waste Permitted Facilities (Soil and Stone)* *Local Authority EPA National Waste Database Returns 2003*
Litter and street sweepings.	3,474	*Local Authority EPA National Waste Database Returns 2003,*
Agricultural waste	568,230 (tds)	*Local Authority Sludge Plans*
Mining and quarry waste.	1,165,337	*IPC Licensed Facilities AERs*
Ash and other incineration residues.	68,000	*IPC Licensed Power Stations*
Healthcare Waste	196	*AER for Sterile Technologies Irl.*
Water Treatment Sludges	596	*Local Authority Sludge Plans*
Wastewater Treatment Sludges	6,797	*Local Authority Sludge Plans*
Industrial Sludges	3,522	*Local Authority Sludge Plans*
Contaminated soils.	2,297	*Local Authority EPA National Waste Database Returns 2003*

(Source: Proposed Replacement Midlands Waste Management Plan).

3.6 WASTE MANAGEMENT PLAN (2005- 2010) OBJECTIVES

The policy objectives of the Midlands Waste Management Plan (2005- 2010) are:

- Local authorities will promote campaigns to meet the long-term challenge of waste prevention and minimisation at the household and business level.
- An integrated management approach will be applied to waste generated respecting the EU Waste Hierarchy of treatment solutions – reuse, maximum recycling, energy recovery and minimum landfill disposal.
- Local Authorities will encourage the development of sustainable waste management technologies and services for the Region whilst delivering European and National targets
- It is a goal to create equity of access to waste management facilities and services across the Region.
- Waste treated or disposed of at landfill in the Region will be carried out in accordance with highest environmental standards without causing environmental pollution.

In line with National Policy the Midlands Waste Management Plan will have its fundamental strategy grounded in the concept of an integrated waste management policy on a regional basis. Priority will be assigned in accordance with the EU and National waste hierarchy with a strong emphasis on waste prevention and minimisation. The future policy shall take cognisance of all relevant and pending

regulations, recognise priority waste streams, and promote sustainable waste management practices at local, business and industrial level.

The specific policies and objectives for municipal, industrial and agri-wastes and for priority wastes are given below.

3.7 SPECIFIC POLICIES AND OBJECTIVES FOR MUNICIPAL, INDUSTRIAL AND AGRI- WASTES

1. Waste Prevention and Minimisation

Household/ Community Level	**Policy:** **Waste Management Policy will prioritise waste prevention and minimisation at source as a key strategy component focusing on delivering more tangible success in waste reduction. This will be focused at household, commercial and industrial levels and will take account of new initiatives in this area such as the establishment of a National Waste Prevention Programme.** **Objectives:** Local Authorities shall continue to support and finance the role of the Environmental Awareness Officers (EAOs) on a permanent basis EAOs shall be dedicated primarily to waste awareness and education at the community and household level. EAOs shall continue to promote the home composting campaign with added focus on households, which do not have separate collection of organic waste. Local Authorities shall continue to work in tandem with national initiatives including the Race Against Waste Campaign and the National Waste Prevention Programme

Local Authorities	**Policy:** **The Local Authorities shall adopt a sustainable environmental management approach within their organisations and promote waste prevention and minimisation as much as possible.** **Objectives:** To increase waste prevention and encourage a 'paper free' office culture in each Local Authority To investigate tendering for the purchase of consumables on a Regional basis

Commercial/ Industrial	**Policy:** **The Local Authorities will commit to prioritising waste prevention and minimisation at the commercial and industrial level as outlined in the EU and Irish Waste hierarchy.** **Objectives:** Target waste prevention at the business and industry level by the appointment of Green Business Officers (GBO's) in each county, subject to funding. Creation of the new appointments will be contingent on finance through central funding or other sources such as the National Waste Prevention Programme, Cleaner Greener Production Programme, and private sector sponsorship. Local Authorities shall continue to work in tandem with national initiatives including the Race Against Waste Campaign, and the National Waste Prevention Programme.

2. Waste Collection

Uncollected Waste	**Policy:** **Recognising that the levels of uncollected waste remain unacceptably high in the Region, the local authorities shall endeavour to determine the extent of uncollected waste in the Region and to eliminate 'environmentally unfriendly' and illegal practices relating to the collection and disposal of household waste.** **Objectives:** To reduce the percentage of uncollected waste amongst householders in the Region. To survey householders to determine both the extent of uncollected waste in the Region and the method of disposal for householders without a collection service. To support any national initiatives to ban in-sink macerators. To investigate the possibility of introducing Bye-Laws to make it illegal to use backyard burners for disposing of waste. To increase enforcement proceedings against householders identified as disposing of waste illegally as required
Collected Waste	**Policy:** **The Local Authorities will regulate a three-bin collection service to householders, businesses and industry in the Region. The three-bin system will allow for the separate collection of mixed residual waste, dry recyclables and organics at their source in accordance with the preferred strategy set out in the Draft National Biodegradable Waste Strategy (2004).** **Objectives:** An integrated three-bin collection service shall be implemented in the Region for the separate collection of mixed residual waste, dry recyclables and organics from householders and commercial businesses. The continued expansion of the existing dry recyclable collection to householders and commercial operations The pre-treatment of mixed municipal and industrial waste shall be required prior to landfilling To improve the collection of data and annual reporting from waste collectors to ensure a consistent approach to waste recording and statistics in the Region. To ensure that the putting of skips out in an uncontrolled fashion ceases.

3. Waste Reuse and Recycling

Household/ Community Level	**Policy:** **Local authorities shall continue to promote and develop reuse and recycling at the household/community level to achieve the Regional targets whilst respecting the EU Waste Hierarchy.** **Objectives:** Environmental Awareness Officers shall continue to promote waste reuse and shall research the opportunities for waste reuse/repair A trial waste reuse/repair event shall be run in the Region, with an increase in the scheme to be considered based on the uptake The continued development of civic amenity facilities across the Region Existing and proposed civic amenity facilities are to accept a wider variety of materials specifically WEEE, green waste, household hazardous waste All waste infrastructure (bring banks, civic amenity facilities) should be regularly serviced and maintained to ensure that their capacity is being optimised The Local Authorities will maintain a good distribution of bring banks across the Region Bring banks will continue to be the primary means for the collection of household glass in the Region. To standardise reporting of waste collected at civic amenity facilities and bring banks across the Region The local authorities shall liaise with National Market Development Groups for recycled materials and implement any new initiatives
Local Authorities	**Policy:** **The Local Authorities shall adopt a sustainable environmental management approach within their organisations to address green procurement, reuse and recycling.** **Objectives:** To implement green procurement of office stationery in each Local Authority To increase reuse and recycling in each Local Authority

Commercial/ Industrial	**Policy:** **Local authorities shall continue to promote and develop reuse and recycling at the household/community level to achieve the Regional targets whilst respecting the EU Waste Hierarchy** **Objective:** Local Authorities, through Green Business Officers, shall facilitate workshops in order to identify any opportunities that may arise to reuse waste streams that are being produced at business/industry level, and to disseminate information on successful waste reuse practices. **Policy:** **The Local Authorities shall adopt a sustainable life-cycle approach to new construction projects.** **Objective:** The use of recycled materials in construction projects shall be supported in the Region, with trial projects to be undertaken for new materials. The Local Authorities shall adopt a green procurement approach in future tendering processes for public infrastructural projects and should specify recycled materials where possible. The Local Authorities shall work with the NCDWC to implement the Voluntary Initiative launched by the Council in 2004

4. Biological Treatment

Policy:
The Midlands Local Authorities shall reduce the quantity of biodegradable waste disposed of to landfill in accordance with the mandatory requirements of the EU Landfill Directive (1999) and the targets set out in the Draft National Biodegradable Waste Strategy (2004).

Objectives:
In line with the favoured policy set out in the Draft National Biodegradable Waste Strategy the Midlands Local Authorities will:
Implement a policy of separate collection of organic waste from urban households and relevant businesses
Support the development of biological treatment facilities in the Region that can be shown to be consistent with the overall objectives of the Plan and have regard to principles of good siting.
Support the development of end-markets for the development of compost
Existing and proposed civic amenity facilities will be expanded (where possible) to accept green waste material
The Local Authorities will engage and encourage commercial operators/ farmers to develop green waste facilities

5. Materials Recovery Facilities/Waste Transfer Stations

Policy:
The Local Authorities shall support the development of additional transfer facilities where they can be shown to be consistent with the overall objectives of the Plan and have regard to good principles of siting.

Objectives:
Local authorities shall ensure that MRFs and Waste Transfer stations are operated in compliance with Waste Permits and the expansion of existing facilities to include pre-treatment technology is supported.

6. Energy Recovery

Policy:
In order to support an integrated approach to waste management in the Region, after waste prevention and minimisation, and maximum recycling measures have taken place, non-hazardous residual waste (municipal, industrial and agri) from the region shall be directed to thermal treatment in preference to landfill in line with the EU waste hierarchy. It is estimated that a minimum capacity of 150,000 tpa will be Required.

Objectives:
A thermal treatment facility is required in the Region in order to meet the Plan targets. The Local Authorities shall facilitate the provision of thermal treatment in the Region. A Public Private Partnership arrangement, or similar

approach, may be considered.

Pending the provision of such a treatment facility account shall be taken of thermal treatment developments in neighbouring regions.
The Local Authorities shall explore the mechanisms, for directing municipal waste, which cannot reasonably be recovered, to treatment methods in line with the EU waste hierarchy. This shall include the thermal treatment of waste in preference to landfill disposal in the event of such thermal treatment capacity becoming available for the Region.

7. Mechanical Separation and Mechanical Biological Treatment (MBT)

Policy:
It shall be a policy that the pre-treatment of mixed municipal and industrial waste shall be required prior to landfilling in the Region in the short term to comply with the EU Landfill Directive pending the development of a Waste to Energy facility.

Objective:
Local authorities shall ensure that waste collectors pre-treat mixed municipal and residual waste collected in the Region prior to disposal to landfill from 2007 onwards.

8. Landfill Disposal

Policy:
The Local Authorities will continue to pursue a policy of regional landfill rationalisation in the long term whilst continuing to operate and maintain landfill facilities to satisfy regional demand, to the highest international standards in accordance with Waste Licences issued by the EPA.

Objectives/Target:
Local Authorities will provide adequate landfill disposal capacity in the Region respecting the mandatory BMW targets and until alternative thermal capacity is available to the region.

9. Inter-regional Movement of Waste

Policy:
The proximity principle should be taken into account however it is recognised that there should be flexibility with respect to the movement of waste across regional boundaries and within the Region. The capacity of waste facilities in the Region should, as far as possible, satisfy the needs of the Region whilst allowing some element of flexibility of movement of waste into and out of the Region in line with the policy direction issued by the Minister in May 2005 under Section 60 of the Waste Management Act, 1996 (as amended).

10. Closed Landfills

Policy:
The Local Authorities will have regard to Article 22 (7)(h) of the Waste Management Act, 1996, the Section 60 Guidance issued by the Minister in May 2005 and the Code of Practice when published by the EPA regarding the investigation of former waste disposal/recovery sites in the Region.

Target to 2010:

An updated list of former Waste Disposal Sites in the Region to be finalised as a matter of priority and remediation measures outlined based on site based risk assessments in accordance with the EPA Code of Practice when published.

11. Former Hazardous Waste Disposal Sites

Policy:
The Local Authorities will ensure that their obligations under the National Hazardous Waste Management Plan are fulfilled regarding former hazardous waste disposal sites in the Region.

Objective:

The Local Authorities will develop a Section 26 Register in response to the NHWMP and the 'risk assessment' methodology set out by the EPA or as amended in their Code of Practice, when published, is to be followed.
The Local Authorities shall ensure that the cost of any on-site investigation, monitoring and remediation work should be borne by the 'the polluter'.

12. Cost Recovery

Policy:
The Local Authorities will seek to improve levels of cost recovery for waste management services in keeping with the Polluter Pays Principle.

The Local Authorities will continue to employ, adjust and introduce user fees for waste services and facilities and to use the income from these fees to finance measures taken by the Midlands Local Authorities in accordance with the objectives of this Plan.
Increase cost recovery for functions such as regulation and enforcement.
Seek more financial support from industry under industry's *producer responsibility* obligation; regarding packaging but also other materials and sectors and under the *polluter pays principle.*
Aiming to achieve efficient cost effective facilities for collection, recycling, energy recovery and disposal.
Benefiting from grant assistance from the governments Environment Fund for appropriate schemes or other grant assistance that may become available from national or EU sources.
The full cost of collection, sorting and recycling of packaging waste – less the revenue from recyclables – will be recovered from industry through Repak.
Any company collecting household waste will be required to provide the full range of services outlined in this Plan – Bring Banks, dry-recyclables collection, organic waste collection (when introduced by Local Authorities), Recycling Centres and Bulky Waste collection – or alternatively the Local Authorities will recoup the full costs from the private sector for providing these services.
Using appropriate economic instruments to achieve sustainable waste management.

13. Siting Guidelines for Waste Facilities

Policy:
The Local Authorities will ensure that the development of new waste facilities in the Midlands Region will adhere to good siting principles as set down in the Waste Plan.

In this Plan, the Midlands Local Authorities have outlined general guidelines for the siting of future waste facilities in the Region. Facilities include: Materials Recovery Facilities, Civic Amenity Facilities, Biological Treatment Facilities, Waste to Energy Facilities and Landfill. The future planning and development of any of the listed facilities will need to have regard to these siting guidelines.

14. Integrated Waste Structures

Policy:
The Local Authorities shall seek to ensure that adequate integrated waste infrastructure to meet Plan targets is put in place. The Local Authorities shall work with the private sector to ensure that collection in particular counties is handled by the private sector that the private waste collector will provide or assist in providing balanced infrastructure such as civic amenity facilities or waste recycling centres funded from waste producer charges collected by the private sector.

3.8 SPECIFIC POLICIES AND OBJECTIVES FOR PRIORITY WASTE

Construction and Demolition (C/D) Waste

Policy:
To reduce the generation of C/D waste and ensure that reuse and recycling of this waste is maximised.

Planning
To ensure that, for new construction or demolition projects above the threshold limits as set by the NCDWC, a C/D Waste Plan is prepared by the developer and that the maximum amount of waste material generated on-site is re-used and recycled

To promote the development of centralised facilities such as quarries/pits in lieu of agricultural land.
To promote and encourage the development of construction and development facilities by the private sector to meet the needs of the Region

Recycled Materials and Markets
To promote the re-use of recycled aggregates in all construction projects in the Midlands Region
To ensure that new Local Authority construction job are assessed for the potential use of recycled aggregates
To encourage the development of end–markets for this product by ensuring that public and private sector developments use recycled construction aggregates and other materials where possible

Waste Facilities
To increase regulation and controls at Waste Permit facilities which are used for land recovery activities.
To ensure that contaminated loads are not accepted at facilities and improvements are made in the recording of materials accepted at facilities.

Awareness:
To promote awareness and education to developers of recycled construction products through the planning and waste permit systems
To support and promote the on-going producer responsibility initiatives of the construction industry.

Hazardous Waste

Policy:
The Midlands Region needs to ensure that hazardous waste is addressed through an integrated approach of prevention, collection and recycling and the development of industry-led producer responsibility for key waste streams.

Objectives:
Awareness/Prevention
To promote through educational programmes the ways in which the generation of hazardous waste can be prevented and reduced.
To improve awareness amongst householders and Small-to-Medium Enterprises (SMEs) of hazardous waste materials and the need for these materials to be separately managed.
Collection
To provide adequate coverage for the collection of hazardous waste through civic amenity facilities and mobile collection services.
To address the lack of waste collection services available for SMEs and provide leadership and guidance to industry on the collection and management of such wastes.
Recycling
To increase the level of recycling and recovery of hazardous waste at both the household level and amongst SMEs through educational programmes and the provision of adequate facilities and services.
To maximise re-use and recycling of hazardous waste products for householders and businesses through the development of industry led producer responsibility schemes.
Facilities
To expand the range of hazardous waste materials accepted at Civic Amenity Facilities
To develop fixed storage facilities at Civic Amenity Facilities to increase waste prevention and improve health and safety at each facility
To improve the level of reporting and data collection of hazardous waste from waste collectors and facilities.

Waste Electrical & Electronic Equipment (WEEE)

Policy:
The Local Authorities shall maximise the collection, reuse and recycling opportunities for all WEEE in the Region over the Plan period.

Objectives:
Producers (manufacturers and importers) must provide at least for the financing of the collection, treatment, recovery and environmentally sound disposal of WEEE from private households deposited at collection facilities.
The development of an industry responsibility scheme must provide the required access and availability to facilities/services for householders.

End of Life Vehicles (ELVs)

Policy:
To ensure that that ELVs are dismantled and recovered in a manner which do not cause environmental pollution and ensuring that the recycling and recovery rates of ELVs and their components are met.

Objectives:
Producer Responsibility
To ensure by 2007 that the relevant motor industry operators establish collection systems for all ELVs at no cost to the owner.
To ensure that all collected ELVs are dismantled and recovered in a manner which prevents waste generation and does not cause environmental pollution
To increase the recovery and recycling rates of ELVs and their components and meet the targets specified by the Directive.
To minimise the use of hazardous materials/substances in the manufacturing of vehicles.
To increase the usage of recycled materials in the manufacture of vehicles.

Local Authority
To promote the safe disposal of all ELVs
To ensure that abandoned and burnt-out cars collected by or on behalf of the local authorities are brought to waste permitted facilities for recovery and disposal
To enforce and regulate waste collection permit activities and waste permit holders in the Region and ensure that accurate records and reporting are maintained.

Public
All ELVs should be disposed of in an environmentally sound manner at fully permitted facilities or suitably approved collection points.

Tyres

Policy:
To minimise the illegal disposal of waste tyres and increase the quantity of tyre recycling.

Objectives:
Local authorities will work to ensure that waste tyres are handled and recycled through the right channels in appropriate manner.

Sludges

Policy:
To implement the policy as stated in each Sludge Management Plan.

Objectives:
A summary of the key policy objectives from the Sludge Management Plans/Strategies in each County is as follows:
The development of a main hub centre for the treatment of municipal wastewater sludge within their framework policy.
The designation of satellite centres which would export sludge to the hub centre.
To promote the use of biosolids arising from municipal wastewater treatment plants as fertiliser.

4 BASELINE ENVIRONMENT

4.1 INTRODUCTION

In this chapter the environmental baseline, or current state of the environment in the region is set out. This is to allow future impacts on the environment to be predicted. Sources of data include government agencies, and local authorities and the information is based on availability of data, suitability and relevant level of detail. The baseline gives an indication of environmental problems and issues and key environmental assets/ resources in the region. It is discussed at two levels of scale, a) baseline conditions at the major waste facilities operating in the region, i.e. those covered by Waste Licence and b) the baseline conditions in the Region as a whole. Additional information and tables are contained in **Appendix A**.

4.2 GENERAL DESCRIPTION OF THE AREA

The study area consists of the five Midlands local authorities of Laois, Longford, Offaly, Westmeath and North Tipperary as shown in **Figure 3.1**. The River Shannon stretching from Longford to North Tipperary borders the western extent of the region. The total population of the region is 286,373 (CSO 2002) and it covers 3,306 square miles. The main administrative centres are Portlaoise, Longford Town, Tullamore, Nenagh and Mullingar. The region is predominantly rural with agriculture playing an important part in its economy. Recent national economic growth can also be seen in the ongoing expansion of towns such as Portlaoise and Tullamore. Due to the proximity to Dublin, several regional centers are experiencing pressure for development and greater demands on the infrastructure.

4.3 BASELINE AND WASTE LICENCED FACILITIES

Baseline environmental conditions have been examined in relation to the larger waste facilities in the region. The four licenced landfill sites in the region are examined as these are considered to be the most significant threat to the existing environment. **Table 4.1**. summarises how these facilities are performing, existing conditions, and whether there are any environmental sensitivities in the area.

Other significant waste disposal and recovery activities (e.g. materials recovery facilities (MRF's) and transfer stations) also require a waste licence. There are 3 privately operated MRF's operating in the region. To obtain a licence the EPA must be satisfied that the activity will not cause environmental pollution when it is carried on in accordance with the licence conditions.

The four Local Authority landfills in operation are listed below. There is currently no Local Authority landfill in Co. Longford.

- Ballydonagh (Westmeath County Council)
- Kyletalesha (Laois County Council)
- Ballaghveny (Tipperary North County Council)
- Derryclure (Offaly County Council)

The landfill facilities are required to operate according to EPA licence conditions. The licence covers monitoring of all emissions (e.g., to air, water and soil) as well as environmental management of the site (e.g. leachate collection), closure and aftercare. Also other legislation applies, e.g. the Landfill Directive required that all landfill gas is collected and used. Monitoring results are submitted to the EPA by Local Authorities in the form of Annual Environmental Reports. The data below is mainly is sourced from the 2003 Annual Environmental Reports (AER's) for each facility.

Table 4.1: Licenced Landfills in the Region and Summary of Baseline Conditions

Licenced Landfill Facility	Ballydonagh Landfill (Westmeath Co. Co)	Kyletalesha Landfill (Co. Laois)	Ballaghveny Landfill (North Tipperary Co. Co.)	Derryclure Landfill (Co. Offaly)
Current Status	At current filling rates there is ~ 3 years capacity remaining. Westmeath Co. Co. has applied for extension with 5 lined cells, which will provide capacity until 2011.	12 years remaining capacity. 6ha have been filled.	Area 16.3ha. North Tipperary County Council have applied for a Review of the existing Waste Licence for three new cells. Final capacity is expected to be reached by 2008.	Area 10ha. Existing area is near closure followed by aftercare and restoration. Phase II extension will be complete in the 3rd Quarter of 2005.
Landfill Gas Management/ Air Quality	There is a gas abstraction and flaring system. Elevated CO_2 levels at certain locations, consistent with the migration of small volumes of gas away from the fill area.	Currently there is no landfill gas extraction system. Gas collection and flaring will be installed in 2005 within each completed cell according to licence conditions. CO_2 levels exceeded limits in 2001. This was attributed to background levels from peat decay.	There is currently no landfill gas extraction system and all landfill gas is vented to the atmosphere. Gas flaring will commence after capping and restoration. Methane and Carbon Dioxide levels recorded were within licence limits.	The dust deposition limit of 350mg/m^2/day was exceeded on two monitoring occasions in 2003 attributed to activity on the adjacent bog.
Leachate Management	Leachate collection system in place.	Leachate is collected, treated and discharged. Treated leachate not meeting licence requirements is taken to Portlaoise WWTP.	Cells 1 and 2 no leachate collection but clay liners. Leachate from other cells tankered to WWTP.	Installed leachate holding tank next to wheelwash
Surface water	Monitored upstream and downstream of the site, and on a drainage channel. Results indicate no affect on the local surface water.	Treated leachate is discharged to the River Triogue.	A spring within the landfill is pumped to the Ballaghveny Stream. Results within limits except one occasion; ammonia & suspended solid levels exceeded limits due to low flow and adjacent bog.	Diverted surface water away from waste, to reduce leachate contamination of surface waters
Groundwater Quality and Vulnerability	Some elevated ammonia, zinc and magnesium levels in 2003. Locally important aquifer generally moderately productive in local zones (Ll)*	In 2003 some elevated Ammonia (NH_4-N) levels, typical of peatland area. Locally important aquifer generally moderately productive in local zones (Ll)*.	No significant levels of groundwater contamination. Locally important aquifer generally moderately productive in local zones (Ll)*	Locally important aquifer generally moderately productive in local zones (Ll)*
Biodiversity	Closest Designated Area 0.5km pNHA & cSAC, Crosswood Bog	Closest Designated Area 1km pNHA, Ridge of Portlaoise, also Clonreher Bog	Closest Designated Area 4km pNHA, Ballintemple Bog	Closest Designated Area >1km pNHA, Hawkswood Bog. Landfill sited on cut-away peatland and is bounded by raised peatlands
Landscape/ Amenity	Closest Designated Amenity area/: 6km Lough Ree Area	Closest Designated Amenity area/: 10km Slieve Bloom Mts	Closest Designated Amenity area/: 15km Lough Derg	Closest Designated Amenity area/: 5km Grand Canal
Cultural Heritage including architectural and	Closest monument/ c.700m – enclosure	Closest monument/ c.1.1km– enclosure	Closest monument/ c.1.4km –/moated site	Closest monument/c500m-earthwork/mound

Licenced Landfill Facility	Ballydonagh Landfill (Westmeath Co. Co)	Kyletalesha Landfill (Co. Laois)	Ballaghveny Landfill (North Tipperary Co. Co.)	Derryclure Landfill (Co. Offaly)
archaeological heritage				
Energy	No energy recovery	No energy recovery	No energy recovery	No energy recovery
Transport	Situated close to National Primary route N6.	Situated close to National Primary route N80.	Situated close to National Primary route N7.	Situated close to National Primary route N80.
Population	Nearest Urban centre: Athlone (3km)	Nearest Urban centre: Portlaoise (5km)	Nearest Urban centre: Nenagh (10km)	Nearest Urban centre: Tullamore (5km)

Source: 2003 Annual Environmental Reports (AER's) for each facility. * Source: National Aquifer Bedrock Map.

4.4 BIODIVERSITY, FLORA AND FAUNA

Biodiversity can be defined as the variability among living organisms including terrestrial, marine and other aquatic ecosystems. It includes the genetic, organism, community, and ecosystem level; and loss of biodiversity reduces an ecosystem's ability to recover from natural or human impacts.

Biodiversity can include diversity within species, between species and of ecosystems and is often discussed under the headings habitats and species. In Ireland there are a number of categories of protected areas for the conservation and protection flora and fauna. These are outlined below:

- Sites of International Importance include; Candidate Special Areas of Conservation (cSACs) protected under the EU Habitats Directive (92/43/EEC), established for the conservation of natural and semi-natural habitats and species of flora and fauna and; Special Protection Areas (SPAs) for the protection of birds were established under the Birds Directive of the EU in 1979.
- Sites of national importance are termed proposed Natural Heritage Areas (pNHAs) and are designated under the Wildlife (Amendment) Act 2000. Other sites are Nature Reserves, National Parks Wildfowl Sanctuaries and Refuges for Fauna. The pNHA's, cSAC's and SPA's in the Midlands Region are shown in **Figure 4.1**.

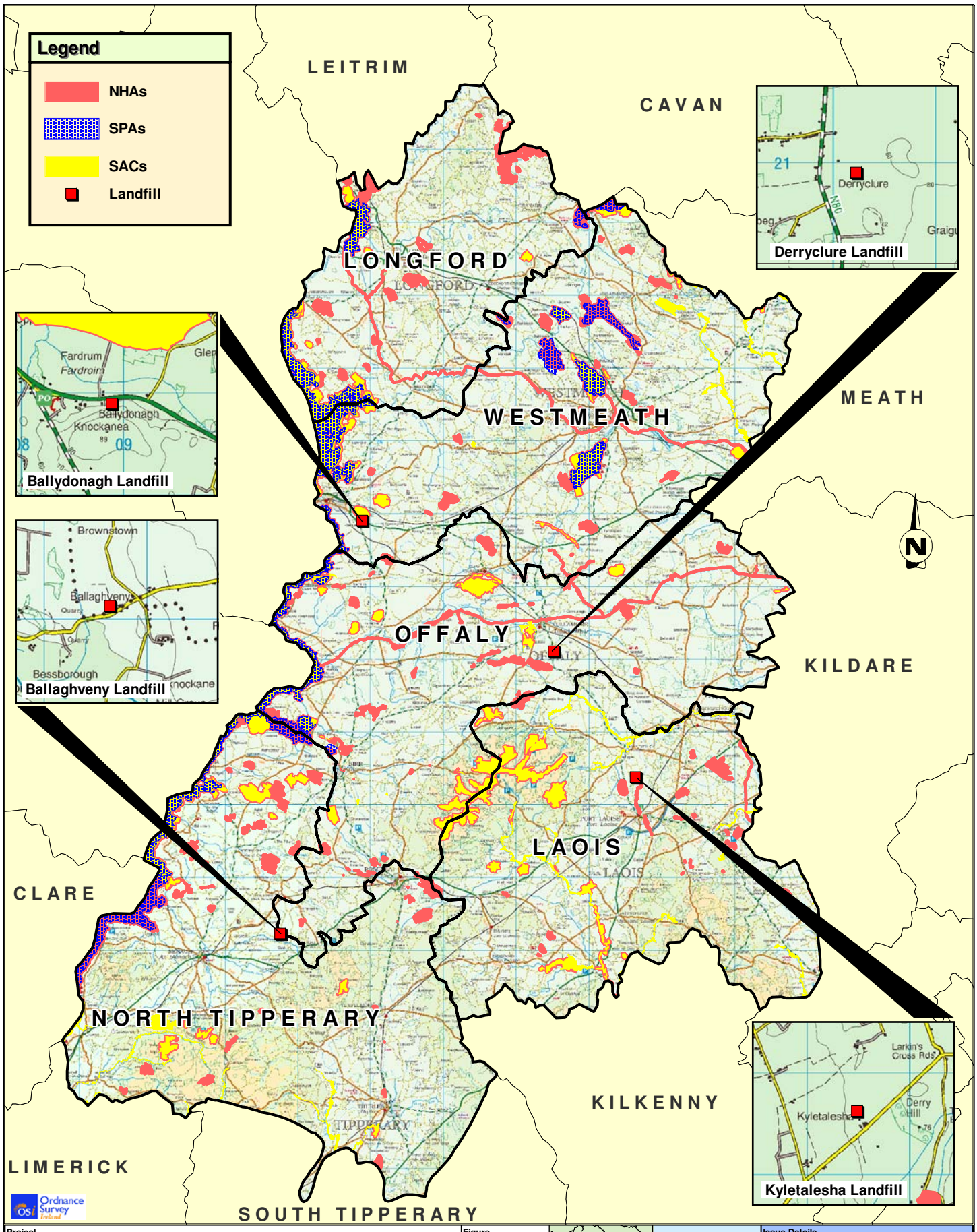
The Midlands area also has Natural Reserves such as the Slieve Bloom Mountains (155,400ha), Timahoe Esker and Mongan Bog. There is one Special Protection Area; Mongan Bog in Co. Offaly and a number of Wetland Sites, being mostly bogs e.g. Clara Bog. These bogs and wetlands are a haven for a huge variety of native and migrant birds. In addition to the protected sites referred to biodiversity also includes species, habitats and ecosystems, which are not designated.

4.5 WATER (INCLUDING SURFACE & GROUNDWATER)

4.5.1 Surface Water

The Midlands region is made up of a number of river catchments the primary ones being the Upper and Lower Shannon, Inny, Brosna, Little Brosna, Camlin, Nenagh, upper reaches of the Barrow, Nore, and Suir and the Clodiagh (Tipperary). **Figure 4.2** shows the catchments and main rivers within the Region and the biological water quality.

Water pollution due to existing waste activities is most likely to be due to contamination from leachate from poorly managed or unlined facilities or due to acidification from deposition of airbourne pollutants.



Project	*Midlands Waste Plan*	Figure	4.1
Title	**Designated Areas and Landfill Locations**		

Source
Department of the Environment and Local Government
www.environ.ie

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Issue Details

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Checked:	MD	File Ref.	MDR0316MI0002D04
Approved:			
Scale:	NTS	Drawing No.	Rev.
Date:	08/07/2005	MI0002	D04

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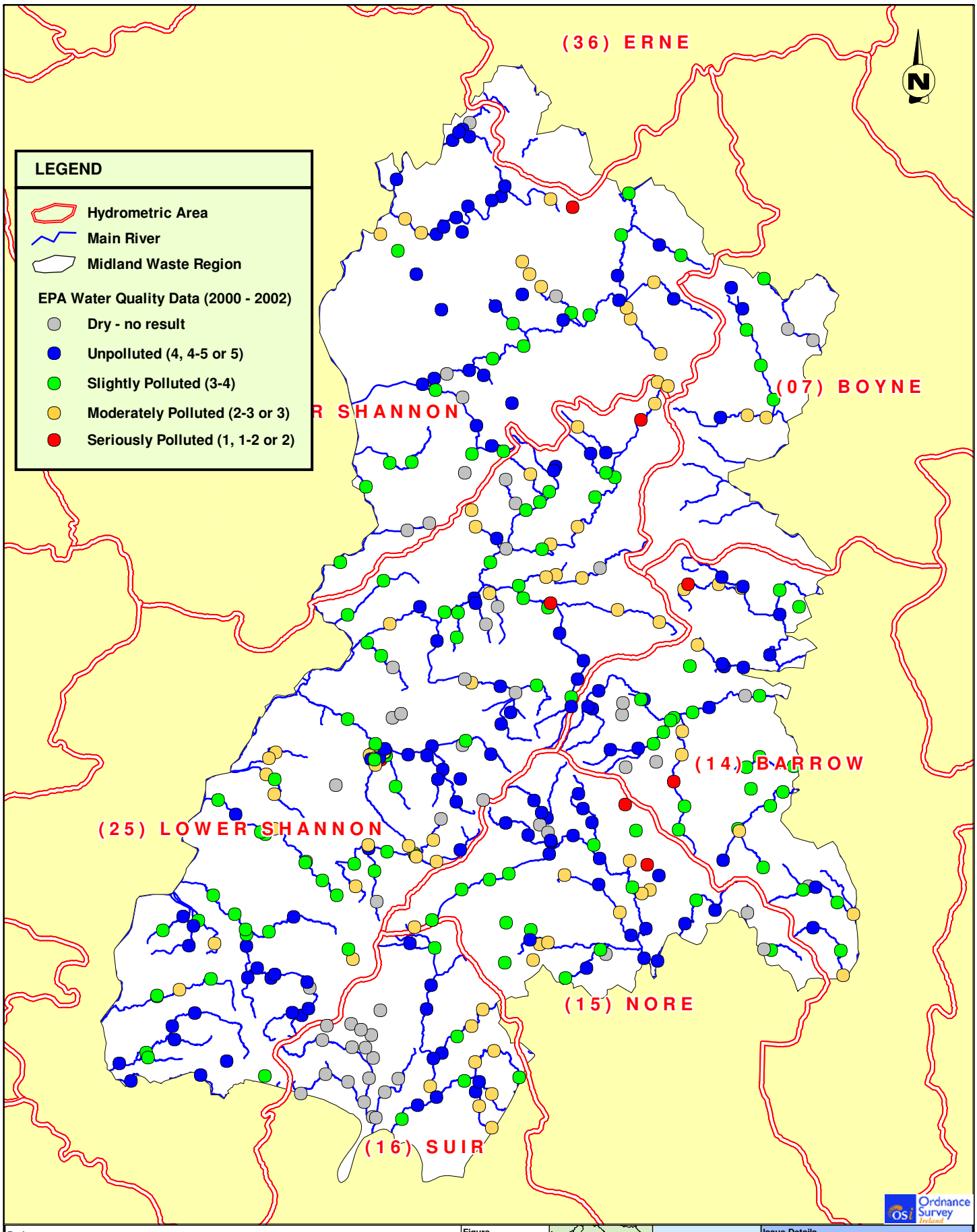

Project	*Midlands Waste Plan*	Figure	4.2
Title	**Hydrology & Water Quality**		

Source
Environmental Protection Agency - Ireland
www.epa.ie

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There are also risks due to closed historical landfills and illegal dumping. Water quality in the vicinity of licenced landfill sites is included in **Table 4.1**.

Generally in the region 54% of river sites are polluted, with 29% slightly polluted and 23% moderately polluted. However this pollution cannot be attributed to waste activities. On a national scale agriculture and sewage account for the majority of moderate and slight pollution. All incidences of serious pollution in the Midlands Rivers are attributed to municipal (mostly sewage) discharges (EPA, 2002a). The water quality of the principal rivers and lakes in the region is outlined in **Appendix A.**

Under the Water Framework Directive (WFD) the objective is to achieving at least "good status" in relation to surface waters, estuarine, coastal and groundwater by 2015. River Basin Management Plans are being prepared for the Eastern, Shannon and South- Eastern River Basin Districts to implement the WFD. Characterisation Reports have been prepared, however the key phase relevant to waste facilities will be in 2007 with implementation of a Programme of Measures. The River Basin Management Plans may also be subject to SEA in the future.

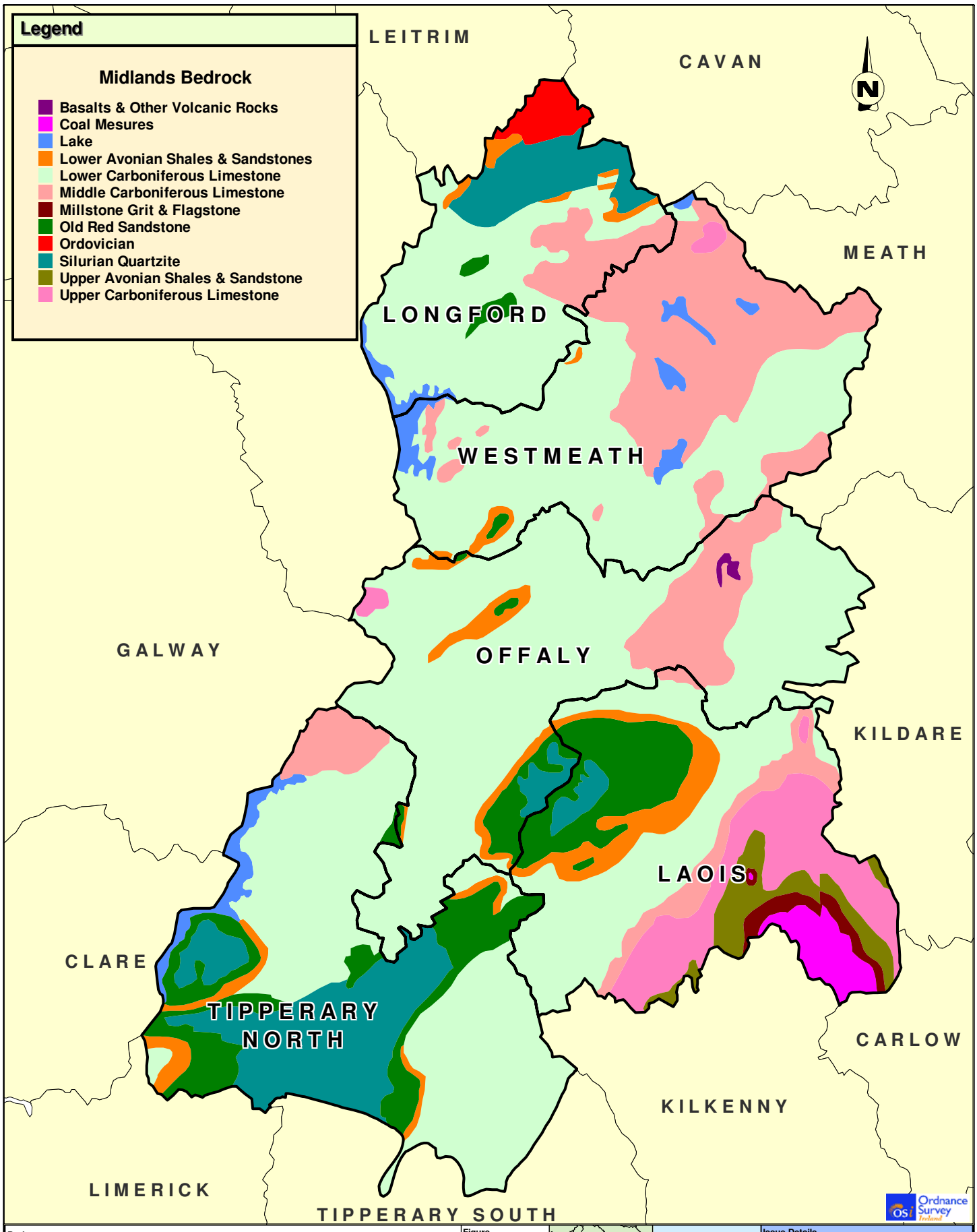
4.5.2 Geology, Hydrogeology and Groundwater Protection

The majority of the Geology in the Midlands comprises Carboniferous Limestone with small pockets of Sandstones and some older Volcanic and Metamorphic rocks. There are also significant pockets of Lead and Zinc Mineralisation in the Midlands, which are being exploited at Lisheen in Tipperary. Lower Carboniferous Limestone predominates throughout the region, with a wide range of rock forms present in smaller areas. The bedrock geology for the region is shown in **Figure 4.3**.

Aquifers are groundwater bodies and in the Midlands are mainly bedrock but also gravel aquifers. The importance of these aquifers will vary with their productivity. Groundwater protection is an important issue and the natural protective properties of any overburden material and soil depth determines aquifer vulnerability to contamination. **Figure 4.4** shows the National Bedrock Aquifer classification for the region. At this level of detail all landfill sites in the region are located over aquifers, which are *Locally important, generally moderately productive in local zones (Ll)*. Groundwater Protection schemes are complete for counties Offaly, Laois and North Tipperary. More detailed groundwater vulnerability is given in **Figure 4.5a** for counties Laois and North Tipperary.

In Tipperary a bedrock aquifer in the Nenagh area is classed as a regionally or locally important depending upon its productiveness with sand and gravel aquifers in particular North of Roscrea. County Laois has two large bedrock aquifers situated between Abbeyleix and Castlecomer and near Mountrath with small sand and gravel aquifers near Portlaoise and Abbeyleix. There is also a large bedrock aquifer running from Banagher to Tullamore. In Westmeath there are small sand and gravel aquifers near Moate, a larger aquifer near Delvin and a bedrock aquifer in the Castletown area. There is a small bedrock aquifer in the Longford Town area with small sand and gravel aquifers at Abbyeshrule and at Granard.

The Geological Survey of Ireland (GSI) in conjunction with the DoELG and EPA developed a Response Matrix for Landfills (see below). The response depends on the risk, aquifer vulnerability and the degree of acceptability of landfill in that area. **Figure 4.5b** shows acceptability for landfill for counties Laois and North Tipperary.



Project	*Midlands Waste Plan*	Figure	4.3
Title	**Bedrock Geology**		
Source	The Geological Survey of Ireland		

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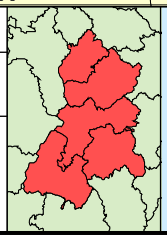

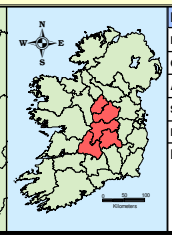

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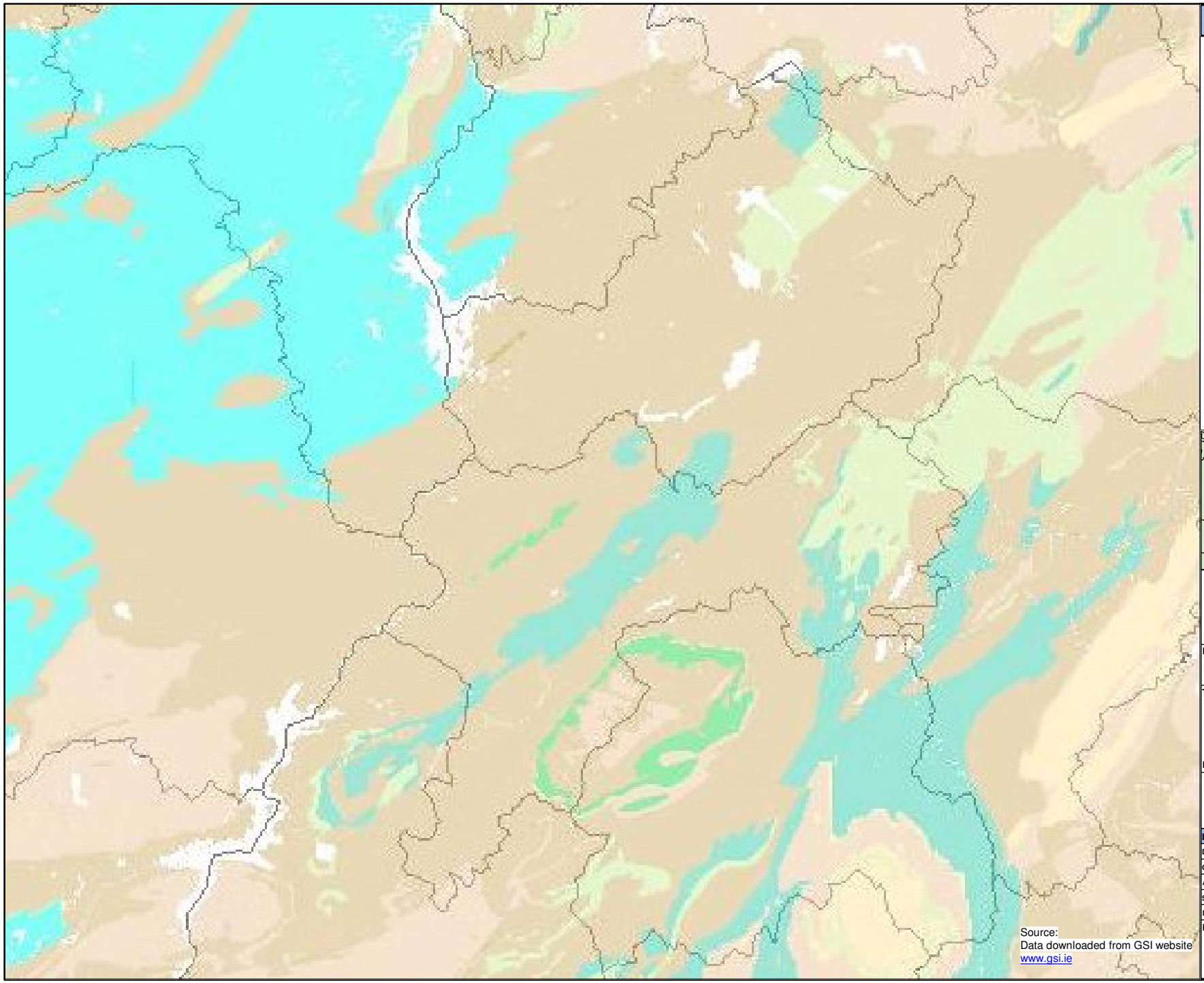
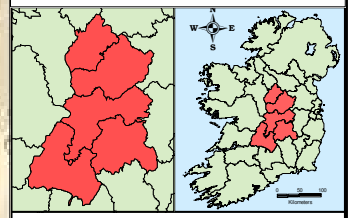


Source:
Data downloaded from GSI website
www.gsi.ie

Legend

- Rf - Regionally important, fissured bedrock aquifer, good development potential
- Rk - Regionally important, karst aquifer, good development potential
- Rkd - Regionally important,diffuse karst aquifer, good development potential
- Rkc - Regionally important, conduit karst aquifer,development potential limited
- Lm - Locally important, generally moderately productive
- Ll - Locally important, generally moderately productive in local zones
- Pl - Poor aquifer, generally unproductive except in local zones
- Pu - Poor aquifer, bedrock which is generally unproductive

County Boundaries



Project
Midlands Waste Plan

Title
National Bedrock Aquifer

Figure 4.4

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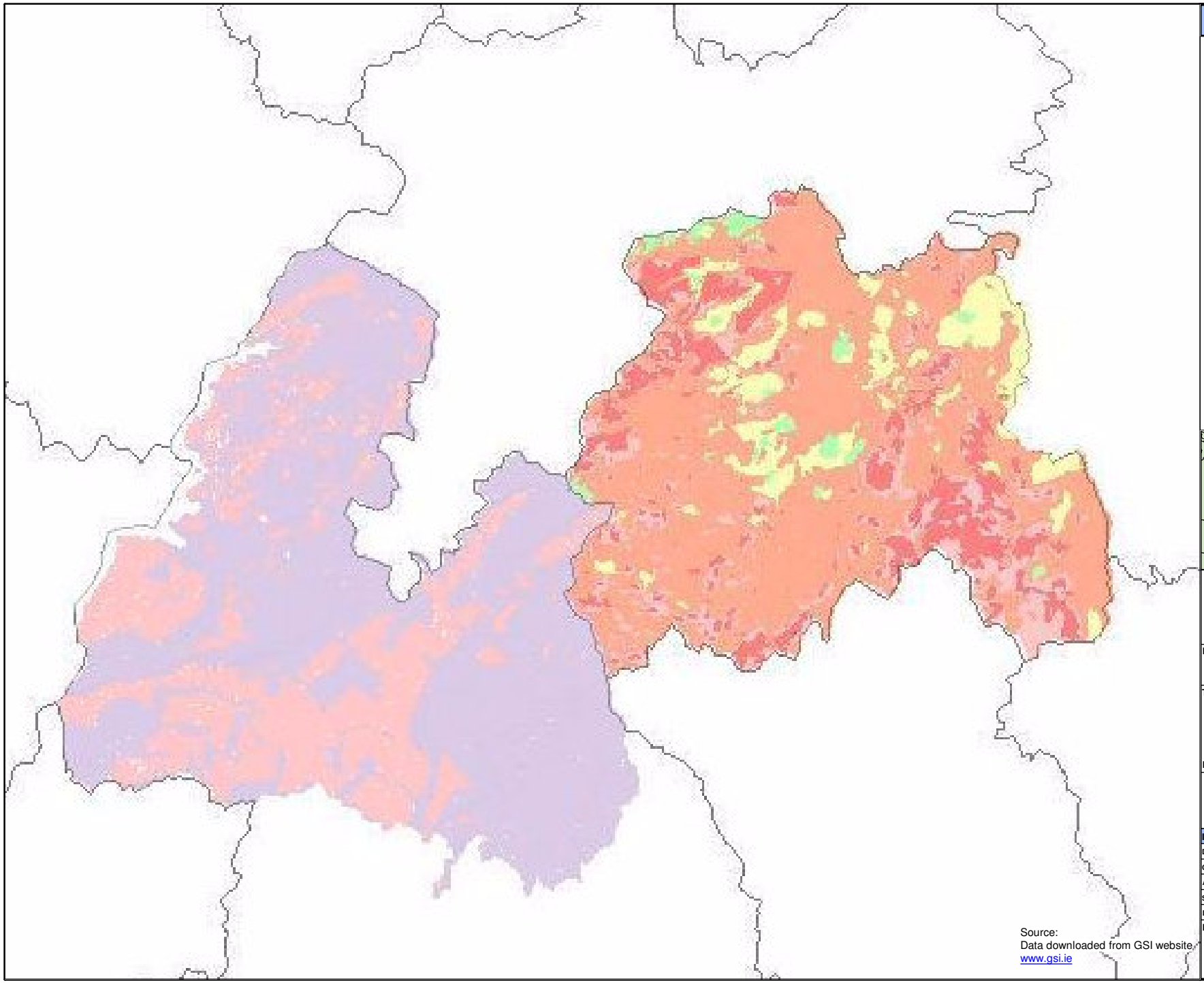
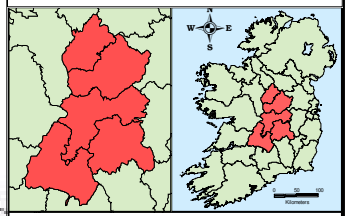


Legend

Tipperary North Vulnerability
- E(Karst/Rock_near_surface)
- E - Extreme
- HL - High to Low. Only an interim study took place

Laois Vulnerability
- E(Karst/Rock_near_surface)
- E - Extreme
- H - High
- M - Moderate
- L - Low



Source:
Data downloaded from GSI website,
www.gsi.ie

Project
Midlands Waste Plan

Title
Groundwater Vulnerability North Tipperary & Laois

Figure 4.5a

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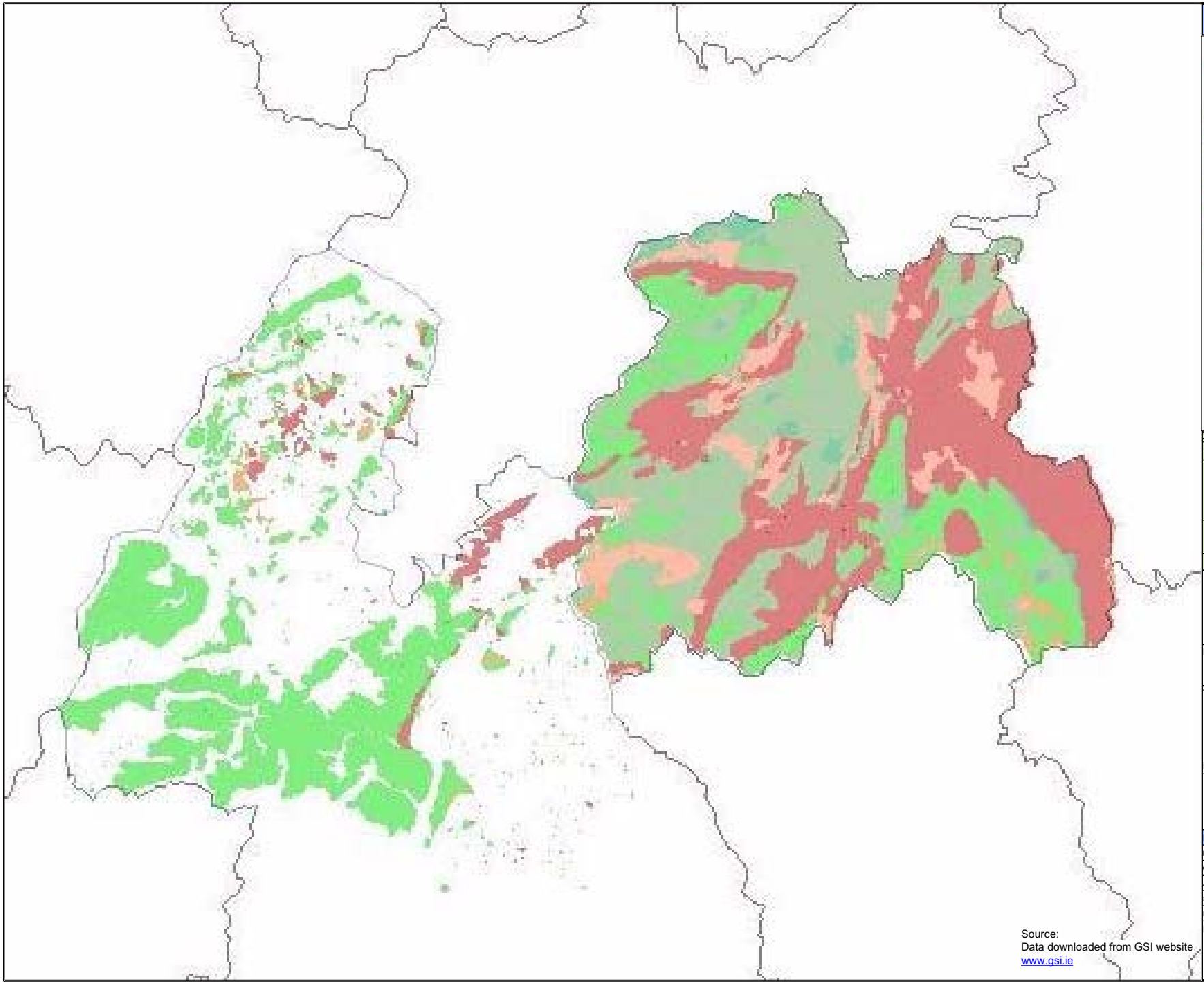
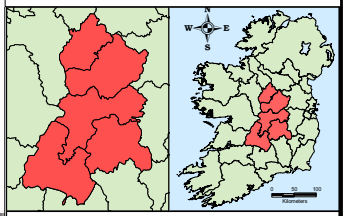


Legend

- R1 - Acceptable subject to guidence in the EPA Landfill site design manual (EPA, 1999)or conditions of a waste licence will apply
- R2(1) - use hyperlink tool to see the response matrix
- R2(2) - use hyperlink tool to see the response matrix
- R2(3) - use hyperlink tool to see the response matrix
- R3(1) - use hyperlink tool to see the response matrix
- R3(2) - use hyperlink tool to see the response matrix
- R3(3) - use hyperlink tool to see the response matrix
- R4 - Not acceptable



Source:
Data downloaded from GSI website
www.gsi.ie

Project
Midlands Waste Plan

Title
Acceptability for Landfill Siting (North Tipperary & Laois)

Figure 4.5b

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Table 4.2: GSI Response Matrix for Landfills (Source www.gsi.ie)

VULNERABILITY RATING	SOURCE PROTECTION AREA		RESOURCE PROTECTION Aquifer Category					
			Regionally Important (R)		Locally Important (L)		Poor Aquifers (P)	
	Inner	Outer	Rk	Rf/Rg	Lm/Lg	Ll	Pl	Pu
Extreme (E)	R4	R4	R4	R4	$R3^2$	$R2^2$	$R2^2$	$R2^1$
High (H)	R4	R4	R4	R4	$R3^1$	$R2^1$	$R2^1$	R1
Moderate (M)	R4	R4	R4	$R3^1$	$R2^2$	$R2^1$	$R2^1$	R1
Low (L)	R4	$R3^1$	$R3^1$	$R3^1$	R1	R1	R1	R1

4.5.3 Drinking Water Quality

In Ireland the majority of groundwater supplies for drinking water are untreated and this increases the importance of groundwater protection. The groundwater source as % of total supply is Laois (95%), Offaly (72%), Tipperary North (50%), Westmeath (20%) and Longford (15%), with the remainder from surface water sources.

The EPA monitors and reports on drinking water in Ireland and the general quality of drinking water within the Midlands region was good for the period 2000- 2002. See **Appendix A**. Contamination was mainly attributed to bacteriological contamination from sewage systems including septic tanks and agricultural pollution..

4.6 AIR QUALITY

The emissions to air arising from waste management can be due to direct emissions (landfill, thermal treatment, composting, anaerobic digestion) or indirect emissions (transports associated with waste collection or disposal). Types of emissions include landfill gas (methane, carbon dioxide), dust (including bioaerosols from composting), odour and noise. Overall air quality in the Midlands Region is within EU limits (for Sulphur dioxide, Nitrogen Oxides and particulate matter. This is based on periodic monitoring carried out by the EPA. However Nitrogen dioxide and Particulate Matter are of concern due to occasionally exceeding EU limits, in particular in urban areas. **Table 4.1** has air quality information in the vicinity of licenced landfills in the region.

Landfills

Landfill gas (LFG) is produced during the breakdown of organic components of waste by anaerobic bacteria with methane (CH_4) and carbon dioxide (CO_2) (in the ratio of 3:2). Both are greenhouse gases and methane in particular is a major contributor to global warming. Gas collection systems can be put in place, to minimise the risk of gas migration, however two of the licnced facilities did not have LFG collection systems in place. Particulate Matter (dust) can also arise, however no exceedances of licence levels were reported. Odour from landfill can be a cause of environmental nuisance, however there were no complaints from the public in 2003 in relation to odour or noise.

Biological Treatment

There are currently no biological treatment facilities as planned for the region. However there is a vermin-composting facility in North Tipperary and there have been complaints in relation to odour. Odour can be an issue when anaerobic conditions prevail. To prevent anaerobic conditions in open air (windrow) composting, the compost is aerated but this can give rise to bioaerosols, which are spores

of the fungus *Aspergillus Fumugatus*, and can be a concern re: public health. Local air quality impacts may be possible when CO_2 is released from open air composting.

Illegal Burning

There could be up to 14,000 tonnes of waste in the region that is unaccounted for, i.e. it is not arriving at a waste treatment or dispsal facility. This waste is potentially disposed of illegally by burning or dumping. The EPA estimates that 93g of dioxins were generated in Ireland in 2000. Of this almost 73% were generated by uncontrolled burning. The main activity is illegal 'backyard burning'. Also future dioxin emissions are predicted to increase to 110g in 2010. Dioxin levels in the Midlands Region are unknown, however levels are considered a problem on a national scale. Given the amount of uncollected waste (up to 14,000 tonnes/year), which is unaccounted for, it is also considered to be a problem in the region.

Traffic Generated Pollutants

The landfills in the region are located in rural areas but are close to main towns (from 3km-10km). (See **Table 4.1**). Waste traffic is by heavy goods vehicles, however the contribution to air quality from waste transport is unknown as there is no data available, no. of journeys etc.

Emissions from road traffic are now the primary threat to air quality in Ireland (EPA, 2000). Nitrogen Oxides (NOx) arise from traffic emissions or any combustion process (e.g. incineration). Oxides of nitrogen contribute to the formation of acid rain and the formation of ozone. Particulate Matter (dust) from heavy goods vehicles (HGVs) may have localised effects on air quality. Carbon Monoxide (CO) and Benzene mainly arise due to petrol combustion. Sulphur Dioxide (SO_2) also arises from diesel engines including HGVs.

Air quality monitoring is carried out by the EPA and Local Authorities at Mullingar, Athlone and Mountrath within the region. At these sites SO_2,NO_2 and PM_{10} levels were within EU limits. However NO_2 and PM_{10} are the air pollutants of concern due to levels occasionally exceeding EU limits in heavily trafficked areas.

4.7 CLIMATIC FACTORS

Methane is one of the major greenhouse gasses responsible for climate change and has 21 times the global warming capacity of carbon dioxide. Under the Kyoto Protocol Ireland must meet targets to reduce greenhouse gases by 2013. Landfill gas is a significant source of methane and CO_2 and facilities are required to have gas management systems in place as a condition of their licence. However Kyletalesha and Derryclure currently do not have gas management systems in place and gas is released to the atmosphere. For individual facilities see **Table 4.1**.

The Midlands has an average rainfall of 800-1000mm per year, which can rise to 1600mm in the higher mountainous areas. The region gets approximately 175 days of rainfall annually and 1400 hours of sunshine. The prevailing wind in Ireland is from a quadrant centred on west-southwest. These are relatively warm winds from the Atlantic and frequently bring rain. Easterly winds are weaker and less frequent and tend to bring cooler weather from the northeast in spring and warmer weather from the southeast in summer. The 30-year average meteorological data from the meteorological station at Birr, Co. Offaly, which is representative of the climate in the Midlands, are listed in **Appendix A**.

4.8 SOIL/LANDUSE

The Midland Regions is dominated by agriculture, which accounts for 79% of landuse. This is mainly pasture with areas of arable land scattered throughout the Region. This is shown in **Figure 4.6**, a landuse map of Corine data for 1990. The land in counties Longford and Westmeath is dominated by grazing, in Offaly and Laois by livestock and in North Tipperary between livestock, arable and dairy and cattle rearing.

Bogs and marshes cover 9% of the landuse including the Bog of Allen. Other bogs in the region include Mongan and Clara Bog in Co Offaly. Forests and semi natural areas also cover 9% of the region. Landuse in the Slieve Bloom Mountains along the Laois-Offaly border includes forestry, as does Lough Boora Parklands in Co. Offaly. Lakes and rivers cover 2% and urban areas represent 1% of the landuse in the region.

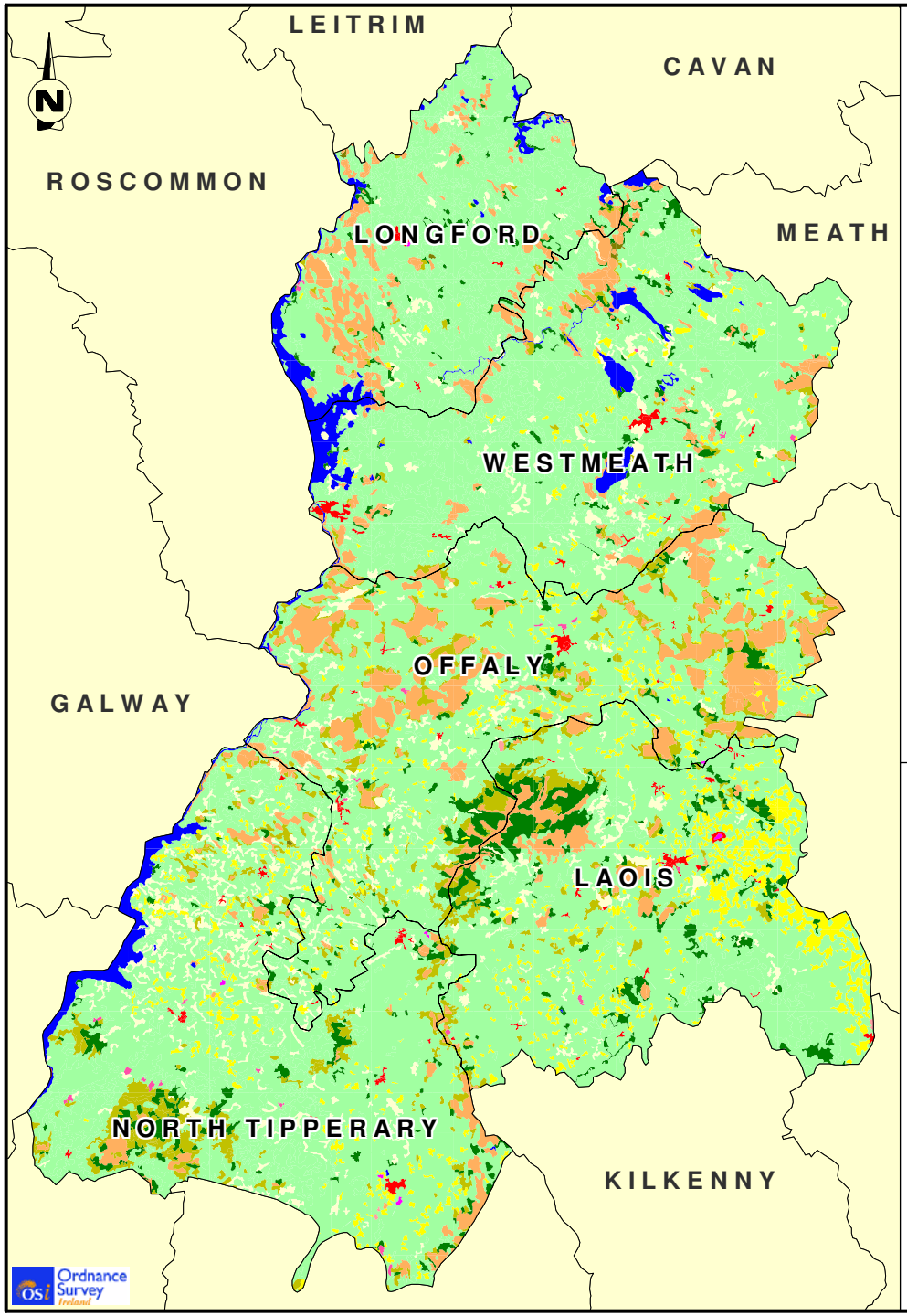
4.9 CULTURAL HERITAGE INCLUDING ARCHITECTURAL AND ARCHAEOLOGICAL HERITAGE

Recorded sites and monuments in the Midlands are detailed in **Figure 4.7**. The potential impacts on these sites were looked at in relation to the 4 existing landfill sites in the region. Sites are located from 500m to 800m from these facilities and are not likely to be directly impacted. Impacts due to proposed facilities will be minimised by following siting criteria as siting for proposed facilities are unknown at this stage. There are over 10,000 located in the region, the majority of which are earthworks (4909 no.) and enclosures (1896 no.). With regard to cultural heritage the following could be potentially impacted on directly or indirectly by existing or proposed facilities:

- Recorded Monuments in or adjacent to the Midlands area,
- National Monuments in State Care or subject to Preservation Orders should be identified and zones of visual amenity defined for them.
- Monuments in the ownership or guardianship of Local Authorities should be identified
- The datasets of the Record of Protected Structures included in all current development plans within the overall area taken in by the Midlands Region.
- Areas of high archaeological potential including subsurface archaeological structures, features and deposits with details of why these areas have been identified. A useful pointer to the potential for the occurrence of sub-surface archaeology is the annual Excavations Bulletin, which contains brief accounts of excavations conducted throughout Ireland each year; the reports can be accessed at www.excavations.ie.

4.10 LANDSCAPE

The Midlands has a variable landscape, which ranges from the peatlands covering much of the central area of the region to the number of glacial landforms in the Midlands such as eskers, kames and drumlins. Lying for the most part between 60m and 120m, the main highland areas are the Silvermine Mountains and Devil's Bit in North Tipperary and the Slieve Bloom Mountains. In terms of landscape and visual amenity local authorities conserve and protect the scenic values of these areas generally as Areas of High Amenity. These areas are not directly impacted by existing licensed facilities (landfills), which are located from 5 to 16km away from these sites (See **Table 4.1**.).

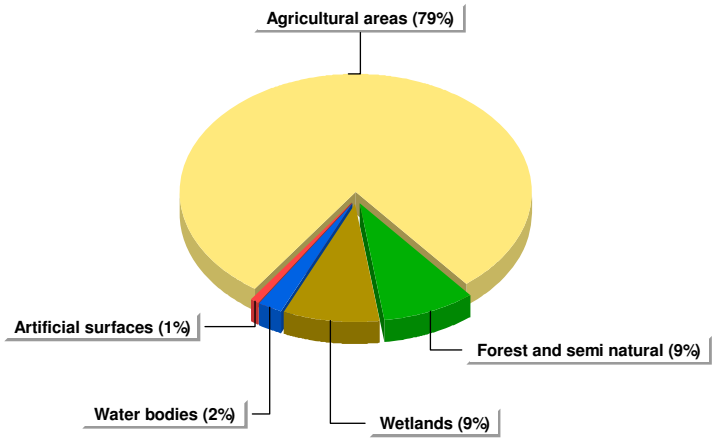


LEGEND:

Corine Landcover

Level 1	Level 2	Level 3
Artificial Surface	Urban fabric	Continuous urban fabric Discontinuous Urban Fabric
	Industrial, commercial and transport units	Industrial or commercial units Roads and rail network Airports
	Mine, dump and construction sites	Mineral extraction sites Construction sites
	Artificial, non-agricultural vegetated areas	Sport and leisure facilities
Agricultural Areas	Arable land	Non-irrigated arable land
	Pastures	Pasture
	Heterogeneous agricultural areas	Complex cultivation patterns Land principally occupied by agriculture
Forest and Semi-Natural Areas	Forests	Broadleaf Forest Coniferous Forest Mixed forest
	Scrub and/or herbaceous vegetations	Natural grasslands Moors and heathland Transitional woodland/scrub
Wetlands	Inland wetlands	Inland Marshes Peat Bogs
	Maritime wetlands	Salt marshes Intertidal flats
Water Bodies	Inland waters	Water Bodies

Corine Landcover Level 1



Source
Corine Landcover Dataset (1990)
from Three Rivers Project

Project
Midlands Waste Plan

Title
Corine Landcover

Figure 4.6

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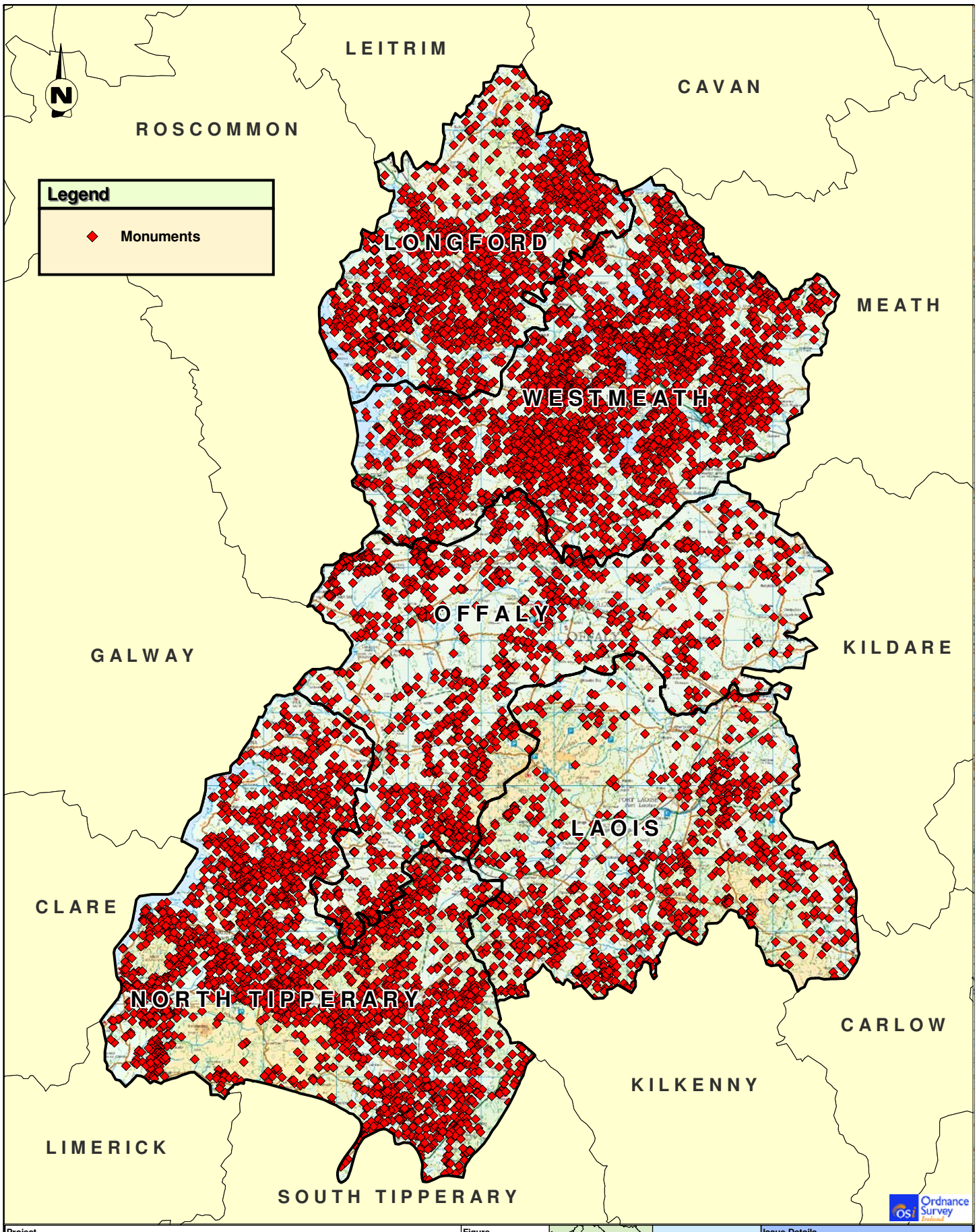

Project	*Midlands Waste Plan*	**Figure**	4.7
Title	**National Monuments**		

Source

Department of Environment and Local Government
www.environ.ie

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Table 4.3: Designated Areas of High Amenity in the Midlands

Local Authority	Areas of High Amenity
Westmeath Co. Co.	Lough Ree Area, Lough Lene Area, Lough Owel Area, Lough Ennel Area, Lough Derravaragh Area and Lough Sheelin Area
Tipperary North Co. Co.	Lough Derg/Shannon High Amenity Area
Offaly Co. Co.	Clonmacnoise Heritage Zone, Slieve Bloom Mountains, Croghan Hill, River Shannon, Grand Canal, Pallas Lake, Raheenmore Bog, Clara Bog & eskers, and Lough Boora Parklands
Longford Co. Co.	Areas contained within the visual catchment of the major lakes in the county including islands on the rivers and lakes within the county boundaries
Laois Co. Co.	Adopted a policy for the Slieve Bloom Mountains, which is contained in a Joint Policy Framework for the Slieve Blooms. It will be the Council's policy to protect and develop views and prospects of high amenity value and to prohibit development, which would detract from such views.

4.11 POPULATION

The population of the Midlands region is 286,373 (2002 CSO), an increase of 8.6% since the previous Census in 1996. The population by County is in **Appendix A.** Census figures (2002) show that population growth in the Midlands is slightly above the National Average of 8%. The region is essentially rural with just 35% of its inhabitants living in areas classified as urban, see **Figure 4.8**. The largest town is Mullingar, with a population of 15,621. Other major towns are Athlone (14,310), Portlaoise (12,127), Tullamore (11,098), Longford (7,557) and Thurles (7,425).

Over the coming years it is anticipated that the current favourable economic climate will be a contributor to further population growth in the region. Furthermore, the effect of the ever-expanding Dublin area cannot be overlooked, particularly for counties Westmeath, Offaly and Laois. Similarly, Limerick City's expansion may influence the population of nearby North Tipperary.

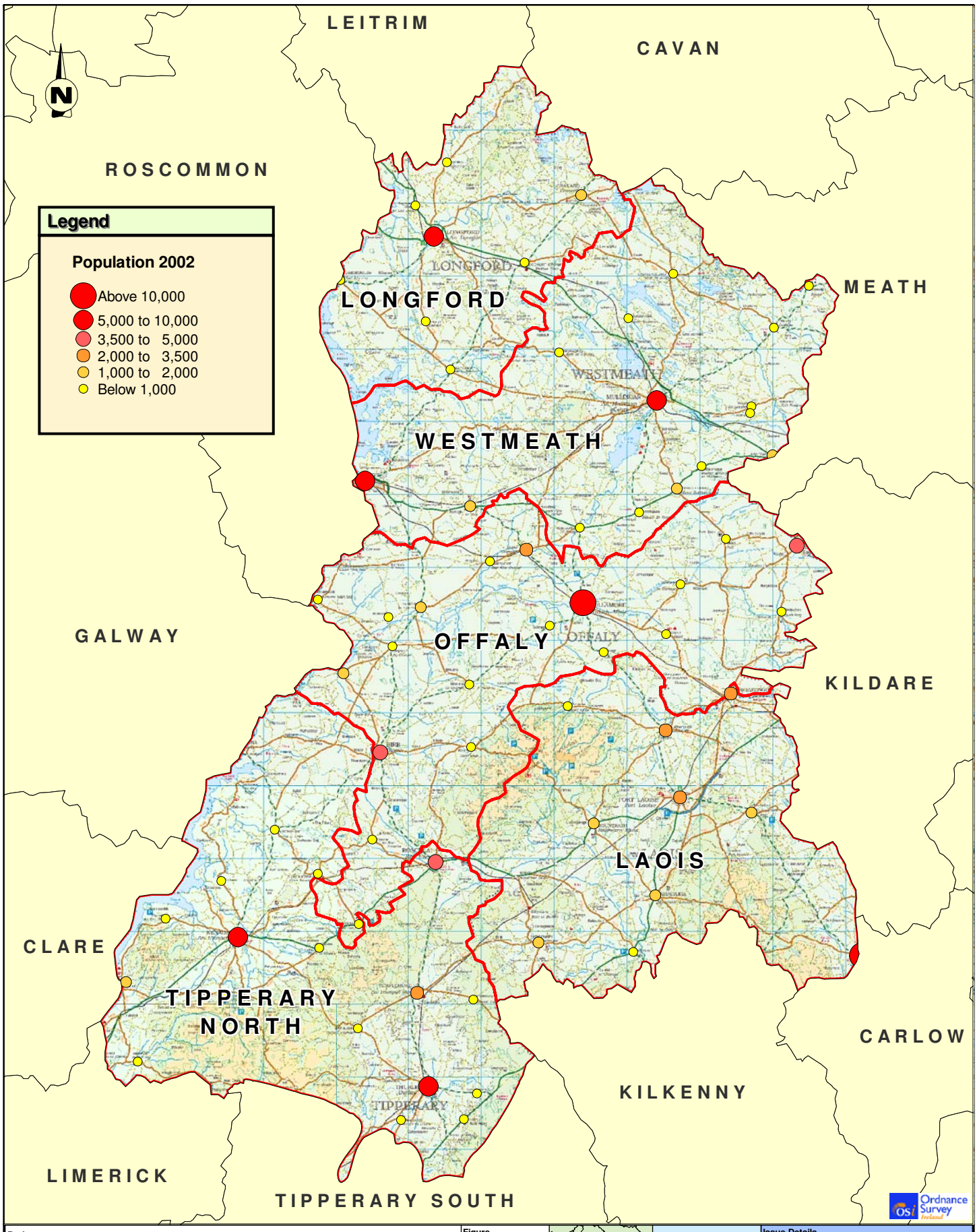
4.12 MATERIAL ASSETS

Material assets are taken to be infrastructure including settlements (towns and villages etc.), buildings and infrastructure, transport infrastructure and utilities. Other material assets including natural resources are covered in; Soils, Landuse, Water, Transport and Energy.

There are 4 landfills operating in the region, which are Waste Licenced. There is currently the following Waste Permitted infrastructure operating in the region: 187 bring banks, 9 civic amenity facilities, and 3 materials recovery facilities. A breakdown of the commercial and industrial sector for the Region was obtained from the Kompass Ireland Directory. There are a total of 11,977 commercial businesses, 594 no. EPA regulated IPC licensed facilities and 528 no. other industries.

4.13 HUMAN HEALTH

There is a lack of human health data available at national, or regional level in relation to waste management, however an overview is given here. A literature review in 2003 on the effects of various forms of waste disposal 'Health and Environmental Effects of Landfilling and Incineration of Waste – A Literature Review', concluded that Ireland had insufficient resources to carry out adequate risk



Project	*Midlands Waste Plan*	Figure	4.8
Title	**Population Map (Census data 2002)**		

Source
Census 2002
Central Statistics Office Ireland
www.cso.ie

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assessments for proposed waste management facilities. The purpose of the review carried out by Health Research Board (HRB), was to inform of the technical aspects of both landfill and incineration practices in Ireland and the effects that these practices may have on the environment and human health. It found that evidence of a relationship between health outcomes and landfill exposures was inconclusive and recommended further research to determine health effect due to waste facilities.

There are potential indirect impacts on human health due to possible contamination of drinking water or bathing water, due to air quality or soil contamination due to waste facilities. Emission limits set in waste licences are based on EU /WHO guideline sand limits to protect human health. Water and air emission for the landfill facilities in the region were within licence limits for 2003 (Source: Annual Environmental Reports, 2003).

4.14 TRANSPORT

Due to its central location, many of Ireland's major routes pass through the Midlands region, as shown in **Figure 4.9**. The national road network forms the basis for most of the transportation and distribution within the country. Management and planning of the national road network is undertaken by the National Roads Authority and the Local Authorities.

The National Primary Routes include the N4, N6 and N55. The M7 passes southwest through the southern part of the Midlands. The National Secondary Routes link the main Midlands towns and provide more localised routes. The principle routes include the N80 Tullamore to Portlaoise, the N52 Nenagh to Tullamore, the N55 Athlone to Cavan and the N62 Athlone to Thurles.

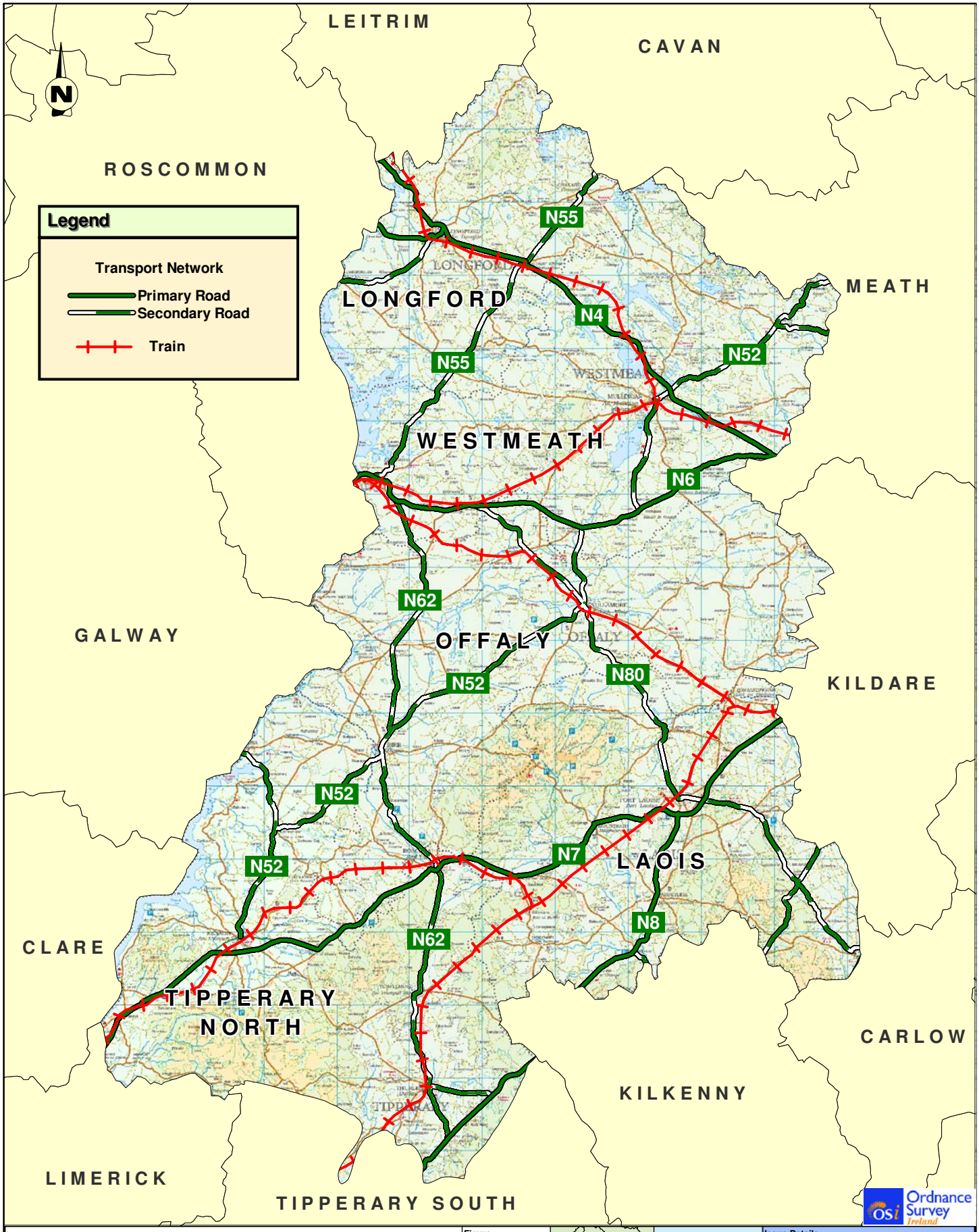
The Midland counties are also relatively well served by rail with a number of mainline routes passing through one or more of the counties. Most of the principle towns are served by rail links, which traverse the region generally in an East-West direction. However to date all waste is currently transported by road. All landfills are in close proximity to National Primary Routes (See **Table 4.1**). In terms of spatial distribution the most northerly landfill in the region is Ballydonagh, which is approximately 60km from some areas of Longford and Westmeath. In the remainder of the region landfills are evenly distributed.

4.15 ENERGY

In 2001 fossil fuels represented 77% of total energy production in Ireland while natural gas represented 21% *(SEI, 2002).* Renewable resources (e.g. hydro production, wind, wave and biomass) represented approximately 2% of Ireland’s energy supply.

Energy recovery from waste is one step above landfill disposal in the waste management hierarchy. Landfill gas can be recovered to produce electricity and heat. Energy recovery from thermal treatment is possible as waste contains large amounts of thermal energy to be harnessed (where 1 tonne of municipal solid waste could yield up to 500kWh of electricity). Also a thermal treatment facility can recover approximately 6 times as much energy as a modern engineered landfill with similar capacity.

At present none of the 4 licensed landfills operating in the Midlands Region have energy recovery, however there are plans for energy recovery at Kyletalesha, Co. Laois. There has also been no progress towards a thermal treatment facility with energy recovery to treat the waste in the Midlands.



Project	*Midlands Waste Plan*	Figure	4.9
Title	**Transport Network**		

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4.16 DATA GAPS

There are a number of areas where there is insufficient data or where the level of detail is not sufficient for the purpose of baseline. These are as follows:

- Groundwater vulnerability and aquifer classification data for Westmeath, Longford and Offaly;
- Air quality data that is specific to the impacts due to waste (main source Annual Environmental Reports);
- Human health data relevant to waste facilities;
- Biological water quality data upstream and downstream of significant waste facilities;
- Traffic or number of journeys related to waste transport and waste activities;
- Energy consumption data for waste facilities.

5 KEY ENVIRONMENTAL ISSUES AND PROBLEMS IN THE MIDLANDS REGION

5.1 INTRODUCTION

Existing environmental problems in the Midlands Region relevant to the Waste Plan and waste management have been identified as part of the SEA. All forms of waste treatment and disposal will have some environmental consequences or issues. These issues relate generally to increased waste generation, and collected and uncollected waste, illegal dumping and burning, landfilling and associated emissions, and historical landfills. In the last 5 years there has been an increase in facility gate fees, a rapid growth in waste and initially a shortage in disposal capacity which has been addressed. Increased problems of unauthorised disposal have occurred as a result and there is also a substantial proportion of waste (up to 14,000 tonnes) that is unaccounted and possibly disposed of illegally by burning or dumping.

The key issues are identified in **Table 5.1** below, which also includes policies in the Plan that will aim to address these environmental problems. The first obligation is to ensure that waste is not handled in a manner that can create pollution.

Table 5.1: Key Environmental Issues in the Region relating to Waste Management

Environmental Receptor	Key Issues or Problems in Relation to Waste Management	Waste Policies and Objectives to Address Issues
Biodiversity, Flora and Fauna	• The impacts on biodiversity, flora and fauna will generally be on a site-specific level. Damage to protected areas (due to habitat loss) or species due to waste facilities, e.g. landfill is a key issue. • There are 4 licenced landfills currently and there are plans for expansion at each. These sites combined occupying approx. 115 hectares. There are no direct impacts on designated areas due to the existing sites. There may be other habitats impacted, landuse is mainly agriculture but also peatland & forestry. • There are increasing volumes of waste being generated with an increased demand for landfill area. • Illegal dumping of waste and historical unlined landfills are a threat to biodiversity, flora and fauna. There is a reported case of dumping waste in disused quarries in Portarlington, Co. Laois. • Anecdotally agricultural, marginal land and wetlands are being used for disposal of infill and C/D material, which could cause potential loss of habitat.	*Waste Prevention & Minimisation* *Landfill Disposal* *Waste Collection* *Uncollected waste* *Historical/Closed Landfills* *Reuse & recycling (C/D)*
Water (Including ground, surface, drinking, aquifer and bathing quality).	• Impacts on water quality due to waste management activities, and in particular landfills will be on a site-specific level but could have repercussions in terms of dispersion of pollutants in the water environment. • A key issue is contamination due to leachate (liquid effleunt from waste) where facilities are unlined. Ballyvenny Landfill, North Tipperary has a number of unlined cells but with clay liners and no leachate collection. • There is an existing biological composting facility (vermi-composting) in North Tipperary, which has been a source of complaints. This is also a potential source of leachate. • Illegal dumping cases have been reported in the region (dumping of waste in disused quarries in Portarlington) and these sites are a risk to surface and groundwater. • Facilities operating without a waste licence or permit or not within licence conditions could cause surface or groundwater pollution.	*Landfill Disposal* *Historical/Closed Landfills* *Biological Treatment* *Enforcement of Waste legislation/ regulation*

Environmental Receptor	Key Issues or Problems in Relation to Waste Management	Waste Policies and Objectives to Address Issues
Air/Climatic Factors	• A key issue is the production of landfill gases, such as methane (CH_4), carbon dioxide (CO_2) and sulphur dioxide. Landfills at Kyletalesha and Ballyveny do not have gas extraction systems in place as yet and these gases are emitted to the air. • From consultations carried out Illegal burning is occurring across the region (producing dioxins) and waste charges may be adding to this problem. • Also there are unlined cells and historical sites in the region, which would not have gas collection/ flaring. The amount of gases produced from these sources is unknown. • There were no complaints re: noise and our from landfill facilities, however there have been odour complaints re: a vermin-composting facility. • The percentage of traffic emissions due to waste transport are unknown. However waste traffic can have a localised impact particularly in already high trafficked areas and small towns.	*Landfill Disposal/* *Waste Collection uncollected waste* *Landfill Disposal/* *Waste Collection*
Soils/Landuse	• Illegal dumping of waste has an impact on soils and landuse in the region, e.g. dumping in disused quarries in Portarlington. • Some waste operators in the region are operating without a permit, and there is a lack of enforcement. Also there is also no mechanism to report illegal dumping. • Anecdotally agricultural land is currently being used due to disposal of infill and C/D material. Implementation of recycling of C/D materials is low, meaning greater use of raw materials. Also C/D waste is poorly quantified. • There has been slow progress with diversion of waste from landfill with additional land required for extensions to facilities. • Closed landfills are not always restored to beneficial use and can be redeveloped.	*Landfill Disposal* *Waste Collection-uncollected waste* *Reuse & recycling (C/D)* *Historical/ Closed Landfills*
Cultural Heritage	• Due to the wide distribution of cultural heritage sites it is possible that some sites are impacted directly or indirectly (e.g. setting) due to waste facilities.	*Landfill Disposal*
Landscape	• Existing landfills are located from 5- 15km away from areas designated for visual amenity. The closest amenity areas to landfill sites are the L. Ree area (5 km from Ballydonagh landfill, Co. Westmeath) and the Grand Canal (5km from Derryclure landfill Co Offaly). • The introduction of waste charges (pay by weight) may be encouraging illegal dumping which is reported across the region • Tidy towns committees have reported illegal dumping and along roadways, laneways and in scenic areas.	*Landfill Disposal* *Waste Collection-uncollected waste* *Waste Collection-uncollected waste*
Material assets	• The potential impacts on material assets in relation to siting of waste facilities can be an emotive issue. • Use of roads by waste vehicles can impact on other road users incl. pedestrians. • There is not enough emphasis on reuse to minimise use of non-renewable raw materials. • See also soils/ landuse, transport and energy.	*Waste Prevention & Minimisation* *Waste Collection* *Waste Prevention & Minimisation, Reuse*
Population	• The Midlands population is increasing and waste generation is also increasing. • All landfills are located in rural areas but are in close proximity to main towns. However there were no complaints re: noise and odour from these facilities. There have been odour issues re: a vermi-composting facility. • Landfill facilities are generally opposed by the public, but provided good practices are followed they are environmentally acceptable.	*Waste Prevention & Minimisation* *Landfill Disposal*

Environmental Receptor	Key Issues or Problems in Relation to Waste Management	Waste Policies and Objectives to Address Issues
Health	• There were no complaints re: noise and our from landfill facilities, however there have been odour complaints re: a vermi-composting facility.	*Waste Prevention & Minimisation*
Energy	• A key issue is energy consumption and associated greenhouse gas emissions due to use of fossil fuels. • For regional waste facilities there is potential for energy recovery from waste (landfill and thermal treatment but this has not been utilised. There is currently no energy recovery from facilities in the region. Recovery may not be feasible at all sites due to their size. • Anaerobic digestion, thermal treatment and associated energy recovery have not been introduced in the region.	*Landfill Disposal* *Thermal Treatment* *Biological Treatment* *Both of the above*
Transport	• Transport and its associated emissions are an issue as towns are becoming more congested in particular the main towns in the region. • There is the potential for accidents associated with waste vehicles, however there is no accident data. • Some forms of waste management can result in a considerable number of separate waste journeys e.g. recycling or MBT. • Also recycling materials are being transported to UK, Europe and to e.g. China, which is not sustainable. • There is a lack of enforcement in relation to illegal movements of waste in general in Ireland.	*Thermal Treatment* *Waste Collection* *Waste reuse and recycling* *Inter-regional movement of waste*

5.2 EVOLUTION OF THE ENVIRONMENT WITHOUT THE WASTE PLAN ("DO MINIMUM" SCENARIO)

The SEA Directive requires that the likely evolution of the environment without the implementation of the Waste Plan be looked at. This is termed the "Do Nothing" scenario. There are two possible scenarios:

A: The evolution of the Environment without the Waste Management Plan.

Were the Waste Management Plan not implemented, waste management would not be controlled and detrimental impacts would occur in relation to biodiversity, water, air, human health & population. In the absence of a Waste Plan the following would result:

- Waste generation would continue to increase with increased impacts on the environment. The environmental issues and problems identified earlier in this Chapter could be worse in the absence of a Plan or a Replacement Plan.

- There would be no framework for managing waste in an integrated way. Decisions in relation to waste management for the region would not be made in a co-ordinated way.

- Investment in infrastructure would not be co-ordinated on a regional basis. This would hinder development of more modern facilities, which would have less impact on the environment (e.g. in relation to air and water emissions, energy efficiency).

B: The evolution of the environment were the Waste Management Plan not reviewed.

The Waste Management Plan, which is subject to a statutory review every 5 years, needs to be adopted and implemented to comply with national and EU legislation and to allow waste policy and waste targets to be achieved. The Replacement Plan, assesses the current situation, takes into account progress since the previous plan, and recent legislation.

In the absence of a Replacement Plan the policies and targets set in 2001 would continued to be used to manage waste in the Midlands for the next 5 years. Also the progress or lack of progress in the previous 5 years could not be considered.

It is noted that progress on the 2001 Waste Plan was slow compared to the 'do nothing scenario', and there was no mechanism for periodic review. However it is now proposed that Annual Reports be prepared by each Local Authority to outline progress in relation to targets in the Plan.

6 ENVIRONMENTAL OBJECTIVES, TARGETS AND INDICATORS

6.1 INTRODUCTION

The aim of SEA is to determine the likely significant impacts on the environment due to implementation of the Waste Plan. This is carried out by assessing the performance of the Waste Plan against a set of environmental protection objectives. In summary:

- An **objective** is a statement of what is intended.
- A **target** is a more specific intended achievement.
- An **indicator** is a measure of variables over time, used to measure progress in achieving the targets and objectives.

6.2 ENVIRONMENTAL OBJECTIVES, TARGETS AND INDICATORS

A set of 13 environmental objectives has been established for aspects of the environment as set out in Annex I of the SEA Directive; (biodiversity, water, air/climate, soils/landuse, landscape, cultural heritage, material assets, population, human health, energy and transport). These have taken into account and reflect relevant EU and national environmental policy and were identified following consultation with the local authorities and environmental authorities

A compatibility matrix was used to identify areas of conflict in relation to the objectives. The aim is to have most of the objectives compatible, which was the case. (See **Appendix C**).

The objectives, and corresponding targets and indicators have been focussed on aspects of the environment that are likely to be *Significantly Impacted* by the Plan. Following the assessment of the Plan these were determined to be Water, Air Quality, Climate, and Transport (See **Table 6.1).** The remaining indicators are outlined in **Table 6.2**. These are referred to as primary and secondary objectives, targets and indicators.

Table 6.1: Primary Environmental Objectives, Targets and Indictors

Environmental Receptor	Environmental (SEA) Objectives	Targets	Indicator
Water (incl. surface, groundwater, drinking, aquifers and bathing)	**B:** Limit pollution to levels that do not adversely impact on water quality	- Compliance of activities with water parameters in licence - No deterioration in water quality downstream of facilities - Meet requirements of Water Framework Directive - Risk Assessment of closed landfills	- Number of licence exceedances for emissions to water - Biological & chemical status up and downstream of facility - WFD monitoring results for waterbodies impacted by waste facilities - Results of risk assessment for closed facilities
Air	**C:** Limit emissions to air to levels that do not adversely impact on air quality	- Compliance of activities with licensed air emissions parameters - Increased collection coverage for municipal waste - Reduce uncontrolled burning/disposal of waste - Maximise potential for energy capture from waste facilities	- Number of licence exceedances for dust and noise - No. of households with a waste collection service - Estimated tonnes of waste uncollected - Amount of energy captured from waste facilities
Climatic Factors	**D:** Reduce greenhouse gas emissions	- Reduce CH_4, and CO_2 emissions from waste facilities - Meet National waste targets including diversion from landfill	- Estimate of landfill gases (CO2 and methane) emitted/year from facilities - tonnes of waste recycled, landfilled and thermally treated
Transport	**L:** Minimise impact of transport associated with waste **M:** Consider use of alternatives to road transport including rail	- Reduce the extent of travel associated with waste and waste related activities - Employ 'Proximity Principle' to the widest extent possible to waste management activities - Minimise waste generation to reduce waste transport - Maximise recycling at source to reduce waste for collection	- No. of waste generated journeys or km travelled - Proximity of waste facilities to population centres - Amount of waste generated (success of waste minimisation) - No. of households with home composting

Table 6.2: Secondary Objectives, Targets and Indictors

Environmental Receptor	Environmental (SEA) Objectives	Targets	Indicator
Biodiversity, flora and fauna	**A:** Limit adverse impacts on biodiversity, flora and fauna	- Site new facilities on non-sensitive sites - Provide compensating measures for any habitat damage	- Proximity of new facilities to designated areas - Area and % of designated habitat damaged due to waste management facilities
Soil/ Landuse	**E:** Limit the use of good quality agricultural land **F:** Limit the adverse impact on soil quality (contamination) and soil quantity	- Net area and quality of land used for waste management activities per tonne of waste in line with international best practice - Site new facilities on non-sensitive sites - Minimise area of land contaminated by waste activities - Return land released from ceased waste activities to beneficial use	- Area of land occupied by ceased and existing waste activities (Total area and greenfield area) - Location of new facilities - Area of land contaminated due to waste activities - Area of land restored for beneficial use
Cultural heritage including architectural and archaeological heritage	**G:** Minimise adverse impact on	- Site new facilities on non-sensitive sites - Protect structures of architectural heritage merit, preserve Architectural Conservation Areas.	- Number of sites of cultural heritage including architectural and archaeological heritage impacted by waste facilites - Number of sites / settings of cultural importance at risk due to waste facilities.
Landscape	**H:** Protect the landscape	- Include landscape and amenity protection in site selection guidelines for new waste management facilities - Maximise the restoration of closed facilities and where possible the phased restoration in keeping with the surrounding landscape - Minimise unauthorised waste activities, fly-tipping, litter	- Number of high amenity areas impacted by waste facilities - Area of land restored for beneficial use - Number of reports of unauthorised waste activities and fly-tipping
Population and Human Health	**J:** Protect human health	- Minimise the risk and impact of accidental emissions from waste management activities - Minimise the level of nuisance associated with waste facilities - Include criteria /guidelines on amenity protection in site selection for new waste management facilities	- No. of reported accidental releases from waste activities - No. of complaints and incidents re: nuisance, noise and odour from waste activities - Proximity of facilities to centres of population
Material Assets	**I:** Maximise use of existing material assets	- Net area of land used for waste management activities per tonne of waste in line with international best practice	- Area of land occupied by waste activities
Energy	**K:** Maximise use of renewable energy sources	- Create balance or net energy generation from waste management activities - Maximise renewable energy generated from waste activities	- No. of landfills facilities with energy recovery - Amount of energy captured from waste facilities

7 ASSESSMENT METHODOLOGY

7.1 INTRODUCTION

Article 5 of the SEA Directive requires that the likely significant effects on the environment due to implementation of the Plan be reported on. The purpose is to identify, predict, and evaluate the likely environmental impacts of implementing the Plan, and to recommended measures to mitigate these impacts.

There are two main stages to the methodology, the assessment of alternatives and the assessment of the Waste Management Plan. Comparison of the environmental impact of alternative waste scenarios, and selection of the preferred option (Best Practicable Environmental Option or BPEO) for managing waste generated in the Midlands region is presented in **Chapter 8**. This was examined during the development of the Waste Management Strategy for the Midlands prepared in 1998. The mix of policies and processes examined were determined on the basis of National and European waste management policy. These policies advocated a regionalised, integrated approach based on a hierarchy of waste management options and targets. Assessment of the Waste Plan and the findings are presented in **Chapter 9.**

7.2 POSSIBLE ALTERNATIVES IN WASTE MANAGEMENT

In principle there are four possible types of alternatives in relation to waste management:

A. Need or Demand

Reducing the need for waste management facilities (particularly disposal) comes through implementation of policies for waste prevention/minimisation, reuse and recycling of waste. Waste management policies can influence waste prevention/minimisation through public awareness campaigns, enforcing producer responsibility, encouraging life-cycle analysis and innovative design for products and/or through taxes and charges.

Waste prevention and minimisation are at the top of the waste management hierarchy and therefore are the ultimate best environmental option. The target of achieving zero waste (i.e. zero waste for disposal) is considered impractical within the existing lifetime (15-20 years) of the national integrated waste management strategy. However the long-term national policy should aim towards the zero waste option. A major emphasis of the policies emanating from the Waste Plan is on waste minimisation/prevention.

B. Mode or Process

Mode or process refers to the best strategic option for managing waste streams using different mixes of technologies and waste quantities. Alternatives scenarios were assessed in the original Waste Plan (adopted 2001) to determine the Best Practicable Environmental Option (BPEO) for managing the Region's waste. BPEO is the analysis of alternatives and the selection of the preferred option that minimises the environmental impact, taking into account what is economical and practicable.

C. Location

The major likely significant impacts of implementing waste policies are expected to be experienced at the location of larger waste management facilities, i.e. recycling centres/ materials recovery facilities, biological treatment facilities, landfill and thermal treatment facilities.

The Waste Plan does not identify specific locations for waste management facilities and therefore the likely impact at specific locations cannot be assessed. However site selection guidelines for waste management facilities are included as part of the mitigation measures recommended in the SEA. The local impacts in relation to individual waste facilities would be addressed at EIA (Environmental Impact Assessment) level.

D. Timing and Implementation

Timing and implementation are considered in the SEA where given in the Plan. The Plan contains a timetable for implementation of the major milestones for the period 2005- 2010. Also annual reports will be produced to review progress and allow an evaluation of resources for both the following year and to the end of the Plan period. Linked to this will be targets and indicators set to measure policy implementation and ultimately to establish whether targets are being met.

7.3 ASSESSMENT OF THE WASTE MANAGEMENT PLAN

As a basis for assessing waste policies the EU Waste Management Hierarchy options (waste prevention, minimisation, reuse, recycle, energy recovery and disposal) were examined in terms of their potential environmental benefits and disbenefits.

The impacts of implementing the individual Waste Plan policies have also been identified. This involved an assessment of each policy against the set of environmental objectives. The likely impact was judged using the assessment criteria in **Table 7.2**, i.e. whether the policies would have a positive or negative environmental impact. The results of the assessment process are in a matrix format with a commentary by way of explanation. The results are given in **Chapter 9**.

The assessment or predictions of impact can be qualitative or quantitative and are to a large extent based on:

- Expert judgements
- Previous experience
- Consultation
- BPEO Model used in Midlands Waste Strategy Report (1999)

Table 7.1. Categories of Impact

Type of Impact	Description
+ Positive Impact	Likely to have a Positive Impact on the environment. In relation to positive impacts it has not been determined if it is Significant
– Negative Impact	Likely to have a Significant Negative Impact on the environment.
0 No impact	No impact or neutral. Impact on the environment is neither Significantly Positive nor Significantly Negative.
? Uncertain impact	The likely impact on the environment is uncertain, due to limited or insufficient information.

7.4 SIGNIFICANCE OF IMPACT

The SEA needs to address the significant effects or impacts of the Plan. The SEA Directive provides broad guidance on defining what impacts are significant. In terms of EIS a significant impact is defined as '*an impact, which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment'* (EPA, 2003). The Irish Regulations (S.I. No. 435 of 2004) state that significant effects should include secondary, cumulative, synergistic, short, medium and long-term, permanent and temporary, positive and negative effects.

The EPA Guidance Document on SEA proposes that evaluation of significance of impacts be determined by asking:

- Will the measure (policy) lead to a risk of environmental standards being breached, and could it lead to failure in achieving environmental targets (relevant in particular for water, air, biodiversity)

- Will it effect environmental resources, which are protected, e.g. Natura 2000 habitats, species, landscapes, water resources, agricultural resources, cultural sites etc, or could it impact on other important resources that are not protected.

Within the assessment results the impact of each waste policy has been recorded using the impact categories in **Table 7.1**. Where possible, measures have been proposed to mitigate the significant impacts identified. Mitigation can prevent impacts or lessen their magnitude of the likelihood of their occurrence.

Impacts due to individual waste facilities depend on the number and location of these facilities, which in the case of the Waste Plan are unknown. Therefore the impacts are only site specific for existing facilities, however site selection criteria are included for location new facilities in non-sensitive areas. These criteria will minimise likelihood of future significant impacts.

Table 7.2: Criteria for Determining Significant Environmental Impacts

Environmental Receptor	Assessment Criteria	Commentary	Significance of Impact
Biodiversity, Flora and Fauna	Size of footprint (landtake) for facility and number of facilities. (For indirect impacts see Water, Air, Soils/ Landuse.)	Most waste management options require a site for collection, sorting, processing or final disposal. The loss of land could have a biodiversity value.	Potential damage to protected area or species. Site specific therefore can only be evaluated for existing facilities.
Water (Includes surface, groundwater quality & quantity)	Potential damage to surface and groundwater as a result of emissions or abstractions due to a waste facility	Certain types of waste management have a greater potential for emissions to ground and surface water, i.e. landfill.	Impact that would be likely to cause watercourses to fail WFD requirements.
Air	Potential volume of air pollutants (NO_X, SO_X, CO, benzene) dioxins, acidic gases, noise or odour. Also See Transport	Most waste management processes result in emissions to the atmosphere. Emission data has been used for each waste option per tonne of waste "managed" where available.	Significance of impact is based on expert judgement and BPEO model.
Climatic Factors	Greenhouse gas emissions	Some waste emissions contribute to global warming. Methane (CH_4) is 21 times greater that Carbon Dioxide (CO_2) in terms of greenhouse effects.	Significance of impact is based on expert judgement and BPEO model.

Environmental Receptor	Assessment Criteria	Commentary	Significance of Impact
Soils/ Landuse	Size of footprint for facility and number of facilities Use of undeveloped and agricultural land.	Land is required for siting collection, sorting, processing, treatment or final disposal facilities. This will have a cost in terms of potential for alternative uses e.g. agriculture.	Landtake in relation to overall land available in region.
Landscape	Visibility of facility in landscape, including height. Size of footprint for facility, number of facilities.	In general larger facilities are most likely to have negative impact on landscape. Impact also depends on height of facility.	Visual impact on Areas of High Visual Amenity. Site specific therefore can only be fully evaluated for existing facilities.
Cultural Heritage including architectural and archaeological heritage	Location/proximity of facility to sites or structures of significance and impact thereon. Size of footprint (landtake) for facility and number of facilities Level of visual intrusion and impact on setting of cultural heritage	Most waste management options require a site for waste collection, sorting, processing or final disposal. The site will have a cost in terms of its potential for alternative uses or it's e.g. heritage, biodiversity value.	Direct impact on a regionally or nationally important site of cultural heritage including architectural and archaeological heritage.
Material Assets	Size of footprint (landtake) for facility and number of facilities Use of resources Impact on existing infrastructure Property value	Recycling options generally result in materials recovery other than energy recovery and this is seen as environmentally beneficial as it reduces the need to win and process new materials.	Landtake in relation to overall land available in region.
Population	Proximity of facility to populations Nuisance potential (noise, vibration, pests, air quality, dust, odour)		Proximity of existing facility to populations
Human Health	Nuisance potential (e.g. noise, odour emissions) Potential for Disease For drinking water, air and traffic see Water, Air Quality and Transport.		Significance of impact based on expert judgement due to lack of specific human health data relating to waste
Energy Efficiency	Amount of renewable energy generated Amount of non renewable energy consumed	Most waste options require processing or treatment which use energy. Where this is supplied by a renewable fuel e.g. waste derived fuel then process is considered energy neutral. Were a fossil fuel is used, or electricity derived from a fossil fuel, then that process is considered to have an energy and emission cost.	Significance of impact is based on expert judgement and BPEO model.
Transport	Emissions generated by waste transport (km) Energy used by transport Accident potential Potential mode of transport	The majority of waste management options result in the transportation of waste from one location to another and in some options waste can be transported several times before final recovery/disposal. Each journey has an environmental cost in terms of energy use, emissions and traffic generation as all waste transportation is currently by road.	Significance of impact is based on expert judgement and BPEO model. Qualitative assessment not possible due to lack of traffic data relating to waste.

7.5 CUMULATIVE EFFECTS

The SEA requires the consideration of 'the likely significant effects of the Plan *… including cumulative and synergistic effects on the environment'.* SEA Guidance in the UK states that 'cumulative effects arise, for instance, where several developments each have insignificant effects but together have a significant effect; or where several individual effects of the plan have a combined effect. The cumulative impacts of implementing the Plan are detailed at the end of the assessment in **Chapter 9**.

7.6 INTERACTIONS

Where a potential exists for interaction between two or more environmental topics, these potential interactions have been taken into account in the assessment and where possible complementary mitigation measures have been proposed. **Table 9.3** shows interactions likely to occur. The level of interaction between the various topics will greatly vary but the table allows the interactions to be recognised and further developed where necessary.

To fully explain what is meant by an inter-relationship or interaction between environmental topics an example is provided. Noise can interact with a number of environmental aspects. Noise issues primarily feature under the heading of Human Environment and most of the standards and guidelines on noise relate exclusively to human beings. However, noise can impact on terrestrial fauna such as birds and also material assets.

8 ASSESSMENT OF ALTERNATIVES AND SELECTION OF BEST PRACTICABLE ENVIRONMENTAL OPTION (BPEO)

8.1 INTRODUCTION

The Best Practical Environmental Option (BPEO) for managing waste generated in the Midlands region was examined was examined during the development of the Waste Management Strategy for the Midlands prepared in 1998. The mix of policies and processes examined were determined on the basis of National and European waste management policy. These policies advocate an integrated approach based on a hierarchy of waste management option and targets (see **Chapter 4**).

The BPEO selected is based on achieving maximum diversion of waste from landfill through implementation of maximum (feasible) recycling and the introduction of thermal treatment of combustible waste. A number of reasonable alternative mixes of waste management processes were considered during the selection process, which included waste management with and without a thermal treatment option and a number of different recycling targets.

As European and National waste management policy has not changed significantly since the original BPEO was selected and as that BPEO was modelled on a 15 year life span (1998-2013) it is not intended to change this overall policy in the replacement plan. This section summarises how the Best Practicable Environmental Option (BPEO) was originally selected and briefly examines progress on its implementation and any changes in policy that have occurred since it was selected.

8.2 DEVELOPING THE BPEO FOR THE MIDLANDS

8.2.1 Selected Technologies and Facilities

The following considerations determined the development of the alternative waste management scenarios for the Midlands Region:-

- *The scenario must respect the EU Waste Hierarchy so that re-use and recycling is preferred as far as possible.*
- *The ultimate solution must be robust, providing a secure route for all waste streams.*
- *Thermal treatment was included as a scenario option for the following reasons:-*
  - *The ambitious targets set out in the National Waste Policy Statement were unlikely to be achievable in practice without thermal treatment*
  - *As a form of energy recovery, it is higher in the National and EU Waste Hierarchy than landfill.*
  - *Thermal treatment with energy recovery is a more desirable environmental option than landfill*
  - *To achieve large bulk reduction in final waste volumes having regard to the high level of public resistance to new landfill development.*

- *Thermal treatment would not compromise the meeting of waste recycling targets and would achieve higher waste recovery resulting in lower landfill requirements.*

- *Optimum location of thermal treatment facilities could maximise energy recovery, including the use of heat for industry, potential use of heat in new residential/commercial developments and electricity production.*

8.2.2 Details of Waste Management Scenarios

A number of integrated scenarios were developed as part of the Midlands Waste Management Strategy (1999) to determine the BPEO for the Midlands waste. These scenarios represented a combination of aspects including recycling targets, the possible introduction of thermal treatment and the landfilling of residuals (i.e. waste that can not be recycled or combusted) only. The environmental impacts *and economic costs* associated with each scenario were calculated by computer modelling. The scenarios considered were:

- ***Scenario 1*** - *Achieve maximum realistic recycling, continue with landfill disposal*

- ***Scenario 2*** - *Achieve national and EU targets for recycling and introduce energy recovery by thermal treatment of combustible wastes.*

- ***Scenario 3*** - *Achieve maximum landfill diversion through implementation of maximum realistic recycling, and thermal treatment of combustible wastes.*

In each scenario, a staged implementation plan for recycling/bulk reduction treatment facilities and the appropriate schemes for waste collection over the planning period were identified. Waste generated at households, commercial and industrial enterprises, was covered as well as from construction and demolition activities. Sewage sludges, agricultural wastes and quarry wastes were not included in the modelling process.

The completion of a number of Waste Strategy studies in regions bordering the Midlands and the recommendations arising from these was likely to have a significant effect on the long term situation in the Midlands particularly with regard to the introduction of thermal treatment. The modelling therefore took into account that a thermal treatment plant might be located within the region or within the regions bordering the Midlands.

8.2.3 Waste Stream Considerations

The distribution of the principal waste streams being recycled, thermally treated and landfilled under each scenario is given in **Table 8.1**, for the year 2013. These were calculated based on factors including current and future waste generation in the region, waste composition data, recycling rates, suitability of markets, available technologies etc.

Under Scenario 1 the majority of waste (55.4%) is landfilled with 44.6% recycled and no waste thermally treated. However in terms of diversion from landfill, it fails to meet the National waste targets. Under Scenario 2 and 3 there would be thermal treatment with only residual waste going to landfill (17.1%). These scenarios present a more integrated system, with Scenario 2 being more biased to Thermal treatment and meeting mandatory National targets (35 % of municipal waste). Whereas Scenario 3 achieves higher recycling rates.

Table 8.1: Waste Stream Targets for 2013 for Waste Scenarios (Alternatives)

Source	Recycling		Thermal		Landfill		Total
	tonnes	%	tonnes	%	tonnes	%	tonnes
Scenario I							
Household/Commerce	72,276	37.6%	-	-	119,923	62.4%	192,199
Industry	19,680	26.3%	-	-	55,251	73.7%	74,931
Construction/Demolition	68,232	79.8%	-	-	17,277	20.2%	85,509
Total	160,188	**44.6%**	-	**-**	192,451	**55.4%**	352,640
Scenario II							
Household/Commerce	66,630	37.0%	119,629	62.6%	5,941	3.1%	192,199
Industry	19,680	26.3%	22,101	29.5%	33,151	44.2%	74,931
Construction/Demolition	68,232	79.8%	-	-	17,277	20.2%	85,509
Total	154,542	**43.1%**	141,729	**39.8%**	56,369	**17.1%**	352,640
Scenario III							
Household/Commerce	72,276	37.6%	113,982	59.3%	5,941	3.1%	192,199
Industry	19,680	26.3%	22,101	29.5%	33,151	44.2%	74,931
Construction/Demolition	68,232	79.8%	-	-	17,277	20.2%	85,509
Total	160,188	**44.6%**	134,297	**38.2%**	56,369	**17.1%**	352,640

8.2.4 Environmental Comparison

An environmental assessment was carried out to provide a comparison of the three scenarios using environmental criteria. The assessment was based on Life Cycle Assessment Principles and was carried out in the following three phases:-

1. ***Inventory analysis****. Compiling an inventory of relevant inputs and outputs of the waste management system.*

2. ***Impact assessment****. Evaluating the potential environmental impacts associated with those inputs and outputs.*

3. ***Interpretation****. Combining the findings from the above to illustrate the different environmental consequences of each scenario.*

The assessment was carried out for the years 2003 and 2007 and can be summarised as follows:-

- *Management of waste in the years 2003 and 2007 – waste amounts going to recycling, thermal treatment and landfill, transport of waste etc. It was assumed that biological treatment facilities would be available by 2003 but that a thermal treatment facility would not be available until 2007.*

- *The environmental impacts are calculated as the Total Load arising from the management of the amount of waste generated in 2003 and 2007.*

Different waste management options can result in different emissions and potential effects on the environment. These parameters are not all easily measured and quantified, hence the environmental assessment is both quantitative and qualitative. The environmental parameters in the study included:

- *CO_2, SO_2, NO_x, CH_4, Particulates, Water emissions, Odour and Noise, Use of land, Consumption or generation of energy, Generation of fertilising material and Generation of secondary raw materials*

The model took into consideration relative emissions for the treatment of a tonne of waste for each management option and the energy consumed or produced. For example recycling was considered a net gain in terms of energy saved compared to the energy required to make a material from scratch and the consequent savings on emissions. The model also took into consideration the environmental cost of transport in terms of energy consumption/resultant emissions. In relation to biological treatment, composting and anaerobic digestion with biogas production were considered.

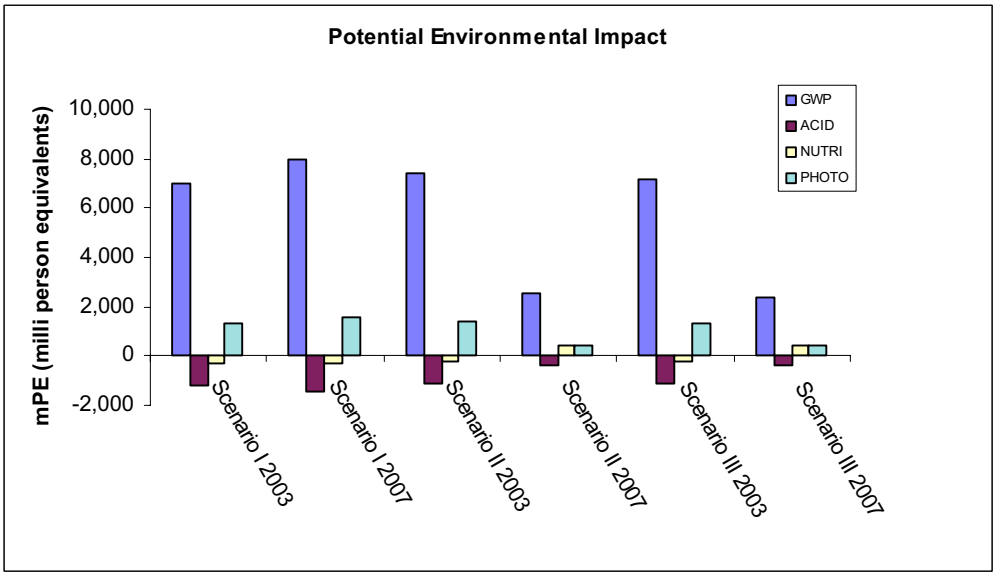
8.2.5 Overall Environmental Assessment

The environmental assessment can be summarised under the following environmental factors;

- *Global warming potential, GWP* (based on CO_2 and the relative contribution of CO_2 and CH_4 emissions)
- *Acidification, ACID* (based on $S0_2$ and the relative contribution of SO_2 and NO_x emissions)
- *Eutrophication, NUTRI* (based on NO_3 and the relative contribution of $N0_x$, Total N and Total P emissions)
- *Photochemical ozone formation, PHOTO* (based on C_2H_4 and the relative contribution of C0 and CH_4 emissions)

Each of the above was converted into units/values that could be compared to PE (person equivalents), which are accepted units of environmental load. The results of the assessment are illustrated in **Figure 8.1**. The higher figures represent a greater environmental load (i.e. impact) on the environment.

Chart 8.1: Comparison of Environmental Impact Categories for each Scenario



Note: The potential environmental impact is reported in "thousands" of mPE and ranges from -2,000 mPE to 8,000 mPE

Global Warming Potential (GWP)

In Scenario 2 and 3, the Global Warming Potential decreases from 2003 to 2007 with the introduction of thermal treatment, as the production of energy and heat replaces energy and heat from fossil fuels. Energy savings due to increased recycling also reduce global warming effects. Hence Scenario 3 – maximum recycling – has a lower GWP than Scenario 2. Under Scenario 1 landfill gases such as methane provide a significant global warming load.

Acidification (ACID)

Acidification will improve for all scenarios. Although transportation and waste treatment contribute to emissions, there are savings as energy would be displaced (saved) through recycling, and heat would be obtained from thermal treatment, which would replace heat produced from other acidifying plants. Again, Scenario 3 was more favourable due to higher recycling and hence more energy displaced.

Eutrophication (NUTRI)

Eutrophication results from the deposition of air emitted NO_x, water emitted NO^{3-} and phosphates. Scenario 1 scores well as there is no Thermal Treatment as do Scenarios 2 and 3 prior to the introduction of thermal treatment. In 2007 there is an increased load, however Scenario 3 would have less of an impact as less waste is thermally treated.

Photochemical Ozone Formation (PHOTO)

Emissions of CO and methane contribute to ozone formation. More of these gases are produced by landfilling and hence in 2007, Scenario 1 has the greatest load or impact. Once thermal treatment is introduced in Scenarios 2 and 3, methane emissions will decrease due to a reduction in landfill.

Summary

The environmental impacts from the above (GWP, ACID, NUTRI, PHOTO) were totalled to give the net environmental load of each Scenario. This is shown in **Figure 8.2**. For the year 2003, Scenarios 1 and 3 score best, since maximum recycling has a low environmental impact. In 2007, Scenarios 2 and 3 reduce the overall impact significantly, since Thermal treatment reduces emissions of global warming gasses and photochemical ozone production, while Scenario 1 remains largely unchanged. Therefore Scenario 3, which combines maximum recycling with Thermal treatment would have the lowest environmental loads in 2007 assuming all planned facilities would be in place.

8.2.6 Conclusion

Scenario 3 - *maximum landfill diversion through implementation of maximum recycling and thermal treatment* – was selected as the Best Practicable Environmental Option (BPEO) for waste management in the Midlands. While the implementation of this BPEO is significantly behind schedule at present, particularly with regard to the commissioning of vital waste management facilities, there has been no significant change in National Policy that would invalidate the outcome of the selection process carried out as above. Also the waste generation figures used for the years 2003 and 2007 were relooked at for the current Waste Plan and it was found that data was over-estimated by approximately 15%. Therefore the BPEO model represents a worst-case scenario in terms of waste generated.

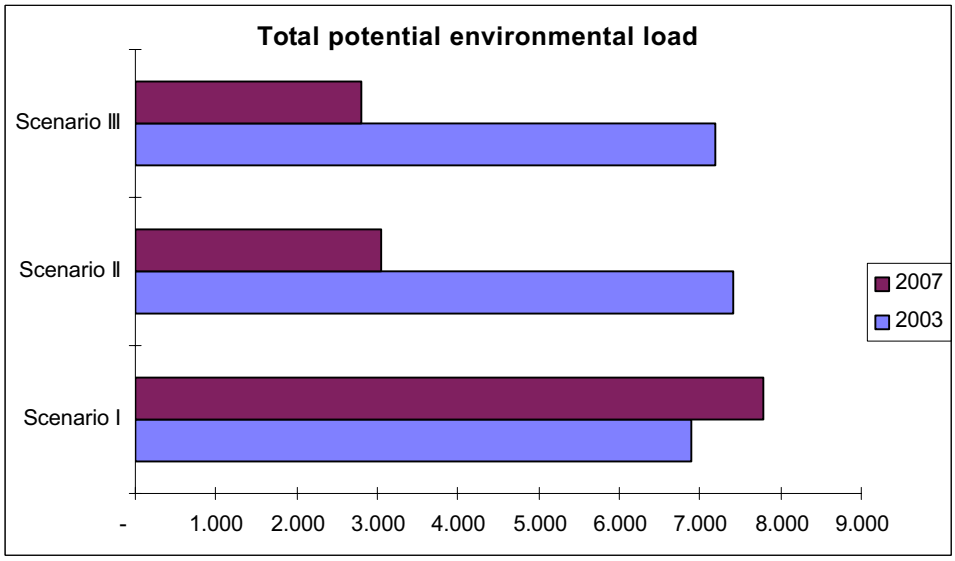


Chart 8.2 Comparison of Total Environmental Load of each Scenario

Note: The potential environmental impact is reported in "thousands" of mPE and ranges from 0 mPE to 8,000 mPE

9 RESULTS OF ASSESSMENT OF THE WASTE PLAN

9.1 INTRODUCTION

The European Waste Management Hierarchy advocates a number of waste management options ranging from most favoured to least favoured option. These options are defined below and examined in terms of their potential environmental benefits and disbenifits (pros and cons). An assessment of the Waste Plan policies follows in **Table 9.1** and **Table 9.2** where the policies for municipal, industrial and agricultural wastes and priority waste are assessed. This evaluates the impacts against the current situation. **Figure 9.1** shows an overview of waste sources, destinations and potential impacts.

9.2 WASTE PREVENTION AND MINIMISATION

Definition: *The reduction of the quantity and of the harmfulness to the environment of waste products.*

Environmental Benefits:

- Most favoured option in dealing with the management of waste
- 'Zero' negative impact on environment (including water and air emissions) if prevention achieved at source
- Eliminates the necessity of collection, processing/treatment and disposal phases of waste management and the resultant negative impacts of these phases on the environment.
- There is a net environmental benefit for every tonne of waste prevented over every other waste management option

Potential Environmental Impacts:

None identified.

Mitigation:

- Waste prevention and minimisation are key target areas for improvement;
- In the past waste generation has been coupled with economic growth. Thus emphasis should be placed on implementing such policies given the forecasts for further national economic growth in the short to medium term;
- Specific targets for waste reduction should be set and there should be some defined method for monitoring the success of prevention and minimisation.

9.3 WASTE COLLECTION

Definition: *The gathering, sorting or mixing of waste for the purposes of its being transported and includes the transport of waste and the acceptance of control of waste. Although not specifically identified in the Waste Management Hierarchy, waste collection, whether door-to-door or at designate facilities is an essential component of the hierarchy.*

Environmental Benefits:

Three bin system (dry recyclables, organics, residual waste) compared to existing two bins:

- Door to door collection of waste is an established system in urban areas for separation and recovery of clean recyclables. This encourages proper waste management at household and commercial level. A three-bin system will encourage further segregation of waste;
- Maximum collection minimises risk of illegal dumping/burning and associated impacts.

- Higher recovery/recycling rates for the region and diversion of organic waste from landfill;
- Lower cross-contamination levels;
- Minimises additional journey's to bring banks etc. and associated costs.

Potential Environmental Impacts:

- 3-bin system may require an additional collection journey. Environmental costs associated with collection journeys, emissions, energy use and traffic. However bins could be collected on alternative weeks with no additional journeys.
- Due to the commercial nature of waste collection in the Midlands – difficult to control treatment and disposal of waste to ensure proximity principle and sustainability. For waste collection there may be a duplication of trips by a number of waste collectors;
- May be odour nuisance associated with organic bin.

Mitigation:

- As mitigation, providing an affordable collection system is the best way to maximise collection and to minimise impacts of illegal dumping and uncontrolled burning;
- Also collection vehicles could be redesigned to be able to take individual fractions of waste together in order to minimise the number of collection journeys.
- There is a need for an integrated approach in waste collection to minimise impacts on the environment.

9.4 REUSE

Definition: *Using a product or component in its original form more than once, e.g. re-filling a glass bottle that has been returned, reusing a plastic bag or in the case of industrial or commercial waste, the recirculation of processing fluids etc.*

Environmental Benefits:

- More favoured option than recycling, treatment (waste to energy) and disposal;
- Material recovery, saving on energy and material cost of new product;
- Energy savings as no processing (except cleaning);
- Reuse within households or industry is possible with little cost, however a major change of current 'throw-away' culture is needed;
- Reduces quantities of waste for collection, treatment and/or disposal.

Potential Environmental Impacts:

- Only feasible for a limited number of products- e.g. glass bottles;
- Environmental costs in collection, transport and cleaning of some reusable items;
- Possible Journey (local, regional or national), Energy use and Emissions;

Mitigation:

- As mitigation more consideration should be given to reuse policies at an industrial and household level, e.g. the potential for "glass bottle" returns. An initiative is needed at a national scale;
- Also promote the elimination of "built in obsolescence" and "throw away culture";
- Consider the promotion of repair of items rather than disposal, e.g. consider the promotion of the collection and reuse of spare parts for cars, machinery etc.

9.5 RECYCLING

Definition: *The subjection of waste to any process or treatment to make it re-usable in whole or in part. Minimising waste by recovering and processing usable products that might*

otherwise become waste (e.g. recycling of aluminium cans, papers, bottles, organic waste, building materials etc.)

Environmental Benefits:

- More favourable option than processing/treatment (energy recovery) or disposal
- Reduce volumes for processing/treatment and disposal (thus reduces the environmental cost in terms of energy and emissions
- Provides recovered material for use or for a different use
- Minimises the use of new raw materials and the processing of those materials
- Savings on CO_2 emissions from energy consumption

Potential Environmental Impacts:

- Footprint of collection facilities (Bring Bank, MRF, Transfer Stations)
- Potential "nuisance" emissions if collection facilities not managed efficiently
- Energy and emission costs associated with collection, transportation, reprocessing, costs depend on the length of journey and the process used to recycle the material.
- Lack of process facilities for recyclables nationally – majority exported abroad to UK, Europe and further afield, e.g. China with associated transport cost. It is not known whether environmental 'costs' outweigh environmental benefits. More information is required to fully evaluate.
- No specific plans to provide processing facilities for recyclables at a regional or national level in the future.
- There may be a lack of outlets for recyclable materials, thus the economic suitability of recycling is uncertain at present.
- Not currently in line with proximity principle

Mitigation:

- The potential negative impacts of recycling, albeit less than that of treatment or disposal, re-emphasises the need to put significant effort into policies for the reduction and minimisation of waste.

  Exporting our waste to other countries is not sustainable in the longer term particularly given the lack of environmental protection in some countries where "recyclables" are processed. While we currently pay the environmental cost of collection and transportation nationally, we are effectively exporting the remainder of the immediate cost abroad. One might argue that everyone will be impacted by global warming as a result of the emissions from waste management, however the most devastating impacts are most likely to be felt in third world countries that have less resources to mitigate the effect.

  There are a number of permitted facilities in the region that collect recyclables including end of life vehicles. However the extent to which these recyclables are recovered and processed within the Midlands region is not clear at this stage.

9.6 BIOLOGICAL TREATMENT

Definition: *The degradation of organic waste by the action of micro-organisms. Composting is the aerobic degradation of organic waste (normally garden waste and kitchen waste; raw vegetables, fruit, teabags). There are generally two forms: Composting in vessels or windrows, end product used as soil conditioner or Anaerobic Digestion.*

Composting

Environmental Benefits:

- Reduces amount of waste for thermal treatment or final disposal
- Clean end product from composting which has a commercial value as a soil conditioner

- Economical method
- Home composting can be done on an individual household basis

Potential Environmental Impacts:

- Footprint of facility (i.e. the physical size and location of the site)
- Impact of traffic near the facility,
- Can be odour, nuisance issues with wind row composting if not designed or managed correctly
- Potential health impact due to spores/ bioaerosols
- Air emissions, leachate etc.
- Acceptance of product, quality, marketability, consumer confidence, feasibility of land spreading end product.

Anaerobic Digestion

Definition: *The anaerobic degradation of biodegradable material, in pressurised vessels with the recovery of gases (particularly methane) for the generation of electricity. Digested material must be stabilised through aerobic windrows prior to use as a soil conditioner.*

Environmental Benefits:

- Reduces amount of waste for thermal treatment or final disposal
- Potential Energy Recovery
- Material recovery, clean end product with low contamination levels, which should have a commercial value as a soil conditioner.

Potential Environmental Impacts:

- Similar to composting – but more likely a smaller footprint.
- May be perceived safety issues with respect to pressurised vessels and harnessing energy.
- Bigger capital investment required than composting.
- Disposal of residuals particularly aqueous effluent, which can be high in nutrients, and can be problematic.
- May be siting constraints in relation to effective use of energy recovered. Also creating a market for the end produce is a national issue.

Mitigation:

- There should be quality control of the end product;
- The collection, treatment and marketing of compost need to be co-ordinated on a regional basis.
- Treatment methods need to be refined in order to minimise emissions from treatment facilities that have an environmental impact (particulates and dust, odours etc).

9.7 THERMAL TREATMENT/ENERGY RECOVERY

Definition: *A range of heating or combustion technologies used to process/treat waste. The individual technologies differ significantly but each involves the generation of large quantities of heat and electricity.*

Environmental Benefits

- Large scale significant reduction in bulk for disposal
- Potential to dispose of all wastes other than hazardous waste
- Can be energy neutral or positive. With energy recovery (heat and electricity) there is a resultant replacement of fossil fuel and saving on CO_2 emissions
- One outlet for waste – minimise environmental cost of collection, transportation and handling.

Potential Environmental Impacts:

- Emissions to atmosphere and potential health risks
- Footprint of facility – site in proximity to housing, commercial or industry for most efficient use of energy recovery as district heating
- Potential from traffic and nuisance but this would be similar to landfill
- Hazardous residue to be disposed of (from air scrubbers)
- Bottom Ash residue produced but can be recycled

Mitigation:
In order to maintain a high level of energy recovery, a thermal treatment facility would ideally be located in proximity to larger densely populated areas in order to have access to district heating infrastructures/provide future access to such infrastructures. This additional but essential facility in energy recovery depends on the formulation of policies of how district-heating market is set up and accessed. Can be sustainable in the long term.

9.8 MECHANICAL BIOLOGICAL TREATMENT (MBT)

Definition: Removal of glass, metals and bulky fractions, in vessel composting and refuse derived fuel (RDF) as residual end product.

Environmental Benefits:

- Stabilises waste
- One central facility can be used to treat "residual waste" (remaining household waste once clean recyclables have been removed) and organics
- Volume reduction prior to landfill - may contribute to meeting requirements of the Landfill Directive;
- meets requirement of Landfill Directive
- Materials recovery for recycling
- Benefit in terms of emissions saved by using renewable energy source if RDF used in power plant / cement kiln

Potential Environmental Impacts:

- 'Dirty' processing to recover materials.
- Handling and transport costs for separated waste, recyclables (e.g. glass, metals)
- Footprint of facility
- Emissions and other nuisance factors if facility is not managed effectively.
- Uncertain market for end product
- 'New' technology, which has not yet been developed although there are various systems in operations.

Mitigation:

There are currently not MBT facilities nationally and the type and operation of MBT facilities can vary significantly. It is assumed that any regional or national facility will produce a "refused derived fuel that can be used in kilns or incinerators". End users for this fuel would have to be identified and sourced.

9.9 LANDFILL DISPOSAL

Definition: Waste disposal facility used for the deposit of waste onto or under land. Modern landfills are lined to prevent leachate escaping into ground or surface water, capped to prevent landfill gases escaping to the atmosphere and have systems to recover those gases and either use them to produce energy or flare them off to reduce methane emissions.

Environmental Benefits:

- Adheres to proximity principle (a landfill per county)
- Can be energy neutral (collection and harnessing of landfill gas)
- There is currently the potential to dispose of all waste except hazardous waste in existing landfills in the Region to 2011.

Potential Environmental Impacts:

- Adheres to the proximity principle;
- Facilities can strive to be energy neutral or to maximise energy recovery (collection and harnessing of landfill gas). However in the region landfill gases are not recovered;
- Potential to dispose of all waste (other than hazardous) in existing landfills up to 2011;
- However, potential environmental impacts include emissions of greenhouse gases (methane, carbon dioxide) to the atmosphere;
- There is also the potential for ongoing leachate emission from unlined cells in historical landfills;
- Landfills can be a source of potential nuisance, if not properly managed (e.g. odour, noise, visual, traffic);
- The footprint (land area) required for disposal is generally large compared to process/ treatment methods;
- There is a weak economic rationale in disposing of material that could be recovered or that could provide for a substantial part of the energy supply;
- There are significant economic and environmental costs in terms of aftercare of closed facilities;
- As more biodegradable wastes are managed by alternative methods, the generation of landfill gases will reduce with a knock-on effect on the economic feasibility of recovering energy from landfills;
- Landfilling is unsustainable in the long term – new facilities would be needed with additional footprint costs, and economic and environmental costs related to aftercare;
- The continued reliance on landfill to dispose of the majority of waste generated is contrary to national and EU waste management policy.

Comment:

There are currently 4 landfills in the Midlands region that have capacity until 2011. These landfills can accept the majority of the types of domestic/commercial/industrial waste generated in the region.

However, the continued reliance of landfill as a means of treatment/disposal of waste is contrary to both national and EU waste management policy. Notwithstanding this, until a thermal treatment facility is up and running this situation will have to continue.

Unsustainable in the long term – new facilities would be needed with additional footprint costs. Also an economic and environmental costs related to after care.

Table 9.1: Assessment of Policies for Municipal, Industrial and Agri Wastes against Environmental Objectives

Policy Summary	A: Biodiversity	B: Water	C: Air pollutants	D: Climatic Factors	E/ F: Soil/ landuse	G: Cultural Heritage	H: Landscape	I: Material Assets	J: Human Health	K: Energy	L/M: Transport	Assessment and Mitigation
1. Waste Prevention and Minimisation **Policy: Prioritise waste prevention and minimisation at source focused at household, commercial and industrial levels.**	+	+	+	+	+	+	+	+	+	+	+	Waste prevention/ minimisation is the most favoured option for waste management. There is no negative impact if prevention is at source. Positive impact for tonnes waste prevented against each tonne waste generated, i.e. prevents impacts of other waste management options. Has long-term sustainability. Reduces waste generation and need for waste transport, treatment and disposal with their associated impacts on air and water emissions. Also reduces the pressure on landtake, therefore positive impact on biodiversity, cultural heritage, landscape, and landuse. Home composting reduces amount of organic wastes for landfill and reduces need for collection/ transport and treatment at a separate facility. Home composting is considered to be waste prevention, as it never enters the waste stream. **Mitigation** - Specific targets for reduction should be set and there should be some defined method for achieving those targets identified. - In the past waste generation has been coupled with economic growth. Thus emphasis should be placed on implementing such policies given the forecasts for further national economic growth in the short to medium term. - There is a perception that recycling of waste has no negative impact. Impacts should be identified in order to further encourage waste prevention. - Producer responsibility initiatives should be introduced to minimise packaging/ waste at production level.
2. Waste Collection **2A. Uncollected Waste** **Policy: LA's shall endeavour to determine the extent of uncollected waste in the Region and to eliminate 'environmentally unfriendly' and illegal practices relating to the collection and disposal of household waste.**	+	+	+	0 /-	+	+	+	+	+	-	-	Where waste is uncollected there is an increased risk that it is being disposed of through illegal backyard burning or by illegal dumping. Policies to increase collection will generally have a positive environmental impact and should reduce the amount of waste disposed of illegally. Uncontrolled illegal burning ("backyard burning") releases toxic pollutants into the air including dioxins, VOC's, carbon monoxide and NO_X. It is a major source of air pollution associated with waste management and accounts for 73% of all dioxins produced in Ireland. Illegal dumping, and fly tipping and associated litter are a cause of surface and groundwater contamination. Uncollected waste also a cause of negative impact on the landscape, landuse, cultural heritage and biodiversity. Policies to eliminate these practices will have a positive impact on these areas. However increased waste collection will have negative impacts on transport & emissions (air pollutants, greenhouse gases) due to extra journeys. Also more energy will be required to treat/dispose of additional waste.

Policy Summary	A: Biodiversity	B: Water	C: Air pollutants	D: Climatic Factors	E/ F: Soil/ landuse	G: Cultural Heritage	H: Landscape	I: Material Assets	J: Human Health	K: Energy	L/M: Transport	Assessment and Mitigation
												Mitigation - Minimise waste production by implementing prevention and minimisation policies. - Minimise waste that requires collection by full implementation of home composing and reuse policies. - Reduce uncontrolled burning and illegal disposal of waste. - Providing affordable collection system is the best way to minimise uncontrolled burning and illegal dumping. - Waste collection and disposal charges however, may have the opposite effect. - Ensure enforcement of waste permitting and licencing. - Employ 'Proximity Principle' to the widest extent possible to waste management activities - Waste collection vehicles could be rebuilt to be able to take individual fractions of waste - in order to minimise the number of collection journeys.
2B. Collected Waste **Policy: The Local Authorities will regulate a three-bin collection service to householders, businesses and industry in the Region. The system will allow for the separate collection of mixed residual waste, dry recyclables and organics at source.**	0	+	+	+	0	0	0	0	0	0/ +	-	The introduction of third bin in 2006 will be regulated by the Local Authorities. The three-bin system will increase diversion of organic waste from landfill. This organic waste would then be treated biologically, which is more favourable than landfill disposal. Less organic waste to landfill would mean less methane emissions, which is positive in terms of global warming. Also biological treatment can be re: energy recovery e.g. anaerobic digestion with biogas production. However three-bin system could generate increased waste collection journeys, with a negative impact on transport. Also increased traffic emissions and energy use. Also biological treatment facilities may not be in place by 2006. Due to private waste collection, there may be duplication of journeys with a number of collections using the same routes on the same days There may be odour potential with an additional bin but this is not considered significant. **Mitigation** - Reduce extent of travel/ no. of journeys associated with waste activities. There should be a more integrated approach to waste collection. - Collection vehicles could be rebuilt to be able to take individual fractions of waste - in order to minimise the number of collection journeys. - Enforcement to ensure waste separated by three-bin system is not remixed after collection.
<u>3. Waste Reuse and Recycling</u> **3A. Household/ Community Level**	+	+	+/ ?	+/ ?	0	0	0	+	0	+/ -	+/ -	Reuse/ repair is more favoured than recycling, but both are favoured over landfill. Both reduce the waste going to landfill and reduce use of new raw materials. Increased reuse and recycling would also result in energy savings and therefore would decrease CO_2 emissions and global warming effects. Reuse is positive re: energy as there is no processing except transport and cleaning. Reuse at source also reduces quantities of waste for collection, treatment and disposal. Sustainability depends on required

Policy Summary	A: Biodiversity	B: Water	C: Air pollutants	D: Climatic Factors	E/ F: Soil/ landuse	G: Cultural Heritage	H: Landscape	I: Material Assets	J: Human Health	K: Energy	L/M: Transport	Assessment and Mitigation
Local authorities shall continue to promote and develop reuse and recycling at the household/ community, commercial and industrial level.												journey length in relation to emission and energy savings achieved from reuse. The main negative impact of recycling is likely to be where recyclables are transported significant distances for reprocessing, i.e. outside Ireland, i.e. UK, Europe and further afield. This results in energy and transport emissions due to apparent considerable distances. Export is not sustainable in long term. However, it is also recognised that based on economies of scale, market forces and end market locations, national facilities for processing all recyclable materials may not be feasible. Overall recycling may not be sustainable in the long term in its current form. More recycling centres may result in more landtake but can be sited to avoid sensitive areas. Bring banks need less land take and impact not significant. Provision of additional recycling centres may impact on transport as increased no. of individual journeys. Adopting a sustainable life-cycle approach to new construction projects would have positive impacts on all aspects of the environment. ***Mitigation*** - Reuse/repair should be promoted rather than disposal. More consideration should be given to reuse at industrial and household level. The potential for bottle returns should be examined at a national level. - More consideration should be given to policies/ actions relating to industrial and household level. Investigate the potential for "bottle" returns and incentives for bottle returns. Feasible to put in place collection and reuse facilities for key products such as glass within 5 year time frame of plan but initiative needed at a National scale. - Promote the elimination of built in obsolescence and throw away culture. - Consider the promotion of the collection and reuse of spare parts for cars, machinery etc. - Recycling: The overall benefits in view of exporting recyclables should be re-evaluated at a national level, particularly in light of lack of process facilities for recyclables nationally. The development of recycling facilities needs to be addressed at a national level. - Employ 'Proximity Principle' to the widest extent possible. - There is a need to co-ordinate and regulate the collection, transportation and final destination of recyclables collected in the Midlands Region. - There should be national policy, guidance or incentives for waste managers to investigate and source sustainable outlets for their recyclables following the proximity principle. These policies should be enforced.

Policy Summary	A: Biodiversity	B: Water	C: Air pollutants	D: Climatic Factors	E/ F: Soil/ landuse	G: Cultural Heritage	H: Landscape	I: Material Assets	J: Human Health	K: Energy	L/M: Transport	Assessment and Mitigation
4. Biological Treatment Policy: The Local Authorities shall reduce the quantity of biodegradable waste disposed of to landfill in accordance with the EU Landfill Directive (1999) and the Draft National Biodegradable Waste Strategy (2004).	+	+/ -	+/ -	+	+	0	0/ +	0	0	+	0/ -	Biological treatment of organic waste could reduce waste for disposal to landfill, which reduces the potential for methane emissions. Treatment is also more favourable than landfill. There is also potential for energy recovery with some types of biological treatment e.g., anaerobic digestion. Composting also provides an end product used as a soil conditioner. There is a lack of regional facilities, however biological treatment could be sustainable in the long term. Also with separation of organic waste there would be less attractions for pests/ birds at landfill sites and less possibility of disease spread. However there can be problems with quality and end markets of compost produced. Also facilities can have leachate emissions is not correctly designed/ managed. There has been public resistance to the siting of composting facilities because of perceived impact regarding emissions, traffic management etc. There are possible health and nuisance impacts due odour, noise and bio-aerosols. **Mitigation** - New biological facilities need to be put in place in the region as soon as possible - Impacts due to new facilities will mainly depend on the siting; facilities should be located on non-sensitive sites. Facilities should operate and be managed according to licence conditions. - Maximise renewable energy generated, e.g. through anaerobic digestion. - The collection, treatment and marketing of compost from organic waste needs to be co-ordinated on a regional basis. - Biological treatment methods need to be refined in order to minimise emissions from treatment facilities that have an environmental impact (particulates and dust, odours etc).
5. Materials Recovery Facilities (MRF)/ Waste Transfer Stations (WTS) Policy: Local Authorities shall support development of additional transfer facilities where they can be shown to be consistent with the overall objectives of the Plan and have regard to good principles of siting.	0	0	0/ +	+	0/ +	0	0	0/ ?	0	+/ -	0/ -	Use of MRF'S increases diversion of waste from landfill disposal. Increased recovery and recycling will have positive impacts with energy and emissions savings. However there could be negative impacts from increased traffic to and from facilities as well as noise from operations. Impacts depend on number and location of facilities. **Mitigation** - Impacts due to new facilities will mainly depend on the siting. Facilities should be located on non-sensitive sites. Facilities should operate and be managed according to licence conditions. - Examine possibility of siting on brownfield rather than greenfield sites. - Employ 'Proximity Principle' to the widest extent possible.
6. Energy Recovery	0	+	- /+	+	+	0	+	+/ ?	?	+	+/ ?	Thermal treatment reduces the waste bulk, and has minimal collection/ handling as one single facility. Also, reduces significantly volume of waste for disposal. This would have a positive impact re: landtake as

Policy Summary	A: Biodiversity	B: Water	C: Air pollutants	D: Climatic Factors	E/ F: Soil/ landuse	G: Cultural Heritage	H: Landscape	I: Material Assets	J: Human Health	K: Energy	L/M: Transport	Assessment and Mitigation
Policy: After waste prevention, minimisation, and maximum recycling, non-hazardous residual waste (municipal, industrial and agri) from the region shall be directed to thermal treatment in preference to landfill. It is estimated that a minimum capacity of 150,000 tpa will be Required.												would reduce requirement for additional landfill. If treating the majority of waste generated will reduce the environmental cost of transporting of waste to various other facilities nationally and internationally. Also has potential for energy recovery (heat & electricity), which would reduce the reliance on fossil fuels, thereby reducing CO_2 emissions. Also thermal treatment is more favourable than landfilling in terms of methane contribution. However there would be an increase in emissions of SO_2 and NO_X. Air emissions from thermal treatment have a perceived negative impact on air quality and human health with emissions including dioxins. However 73% of dioxins emitted in Ireland are generated by uncontrolled illegal burning, most of which is backyard burning of waste. Research studies on incineration and possible health implications have not clearly identified the presence or absence of an impact. However there are no regional or national thermal treatment facilities in operation, and it is unlikely that a facility for the Midlands will be in place within the 5 year time scale of the Plan. However if in place thermal treatment with energy recovery can be sustainable in the long term. **Mitigation** - Maximise renewable energy and heat generation. - Impacts due to new facilities will mainly depend on the siting, technology, footprint and height. Taking account of siting criteria can mitigate these impacts. Site new facilities on non-sensitive sites. Facilities should operate and be managed according to licence conditions. - Examine possibility of siting on brownfield rather than greenfield sites. - Employ 'Proximity Principle' to the widest extent possible. - In order to maintain a high level of energy recovery, a thermal treatment facility would ideally be located in proximity to larger densely populated areas in order to have access to district heating infrastructure/provide future access to such infrastructures.
7. Mechanical Separation and Mechanical Biological Treatment (MBT) Policy: The pre-treatment of mixed municipal and industrial waste shall be required prior to landfilling in the Region in the short term to comply with the EU Landfill Directive pending the development of a Waste to Energy facility.	0	0	+/ ?	+/ ?	0	0	0	0	0	- /?	- /?	Both mechanical separation and MBT increase potential for materials recovery and recycling. They also reduce amount of waste for disposal. However the type and operation of MBT facilities can vary significantly. It is assumed that any regional or national facility will produce a "refused derived fuel (rdf) that can be used in kilns or incinerators". End users for this fuel would have to be identified and sourced. Mechanical Biological Treatment treats both wet and dry "biodegradable" material together. MBT could be energy neutral or positive if RDF produced. The process is positive in terms of material recovery. Possible negative impacts would be increased journeys due to transport of recyclables, nuisance, emissions and footprint of facility. MBT is a new 'unproven' technology and there are no regional facilities in operation. Markets are also not guaranteed for the end product. Long term sustainability of MBT uncertain if thermal treatment introduced.

Policy Summary	A: Biodiversity	B: Water	C: Air pollutants	D: Climatic Factors	E/ F: Soil/ landuse	G: Cultural Heritage	H: Landscape	I: Material Assets	J: Human Health	K: Energy	L/M: Transport	Assessment and Mitigation
												Mitigation - Impacts due to new facilities will mainly depend on the siting and taking account of siting criteria can mitigate these impacts. Site new facilities on non-sensitive sites. - Facilities should operate and be managed according to licence conditions. - Markets for end product (compost/ rdf) should be secured. - Examine possibility of siting on brownfield rather than greenfield sites. - Employ 'Proximity Principle' to the widest extent possible.
8. Landfill Disposal Policy: Local Authorities will continue to pursue regional landfill rationalisation in the long term whilst continuing to operate and maintain landfill facilities to satisfy regional demand.	+	+/ -	-	-	+	+	+	+	+	+	?	Rationalisation of existing landfills would mean fewer landfills with a higher level of environmental protection in the long term. However existing landfills have not yet been closed and there are plans to extend existing facilities with capacity until 2011. If there is continuation of landfill in the short to medium term without rationalisation, and if no thermal treatment is put in place, this will have a significant negative impact on air quality and greenhouse gas emission and risk to surface and groundwater. Therefore the impacts for the next 5 years (short term) will be negative as thermal treatment will not be in place. Most of the waste disposal is to engineered lined cells with leachate collection and gas extraction in place. However landfilling in unlined landfill cells is a risk to surface and groundwater quality. Engineered facilities have no significant impact if properly managed. Where these landfill gases particularly methane are not managed/ collected, e.g. in unlined landfills. Odour/dust can also cause nuisance if poorly managed facility. In engineered facilities the impacts are not significant. Impact on amenity due to perceived nuisances associated with poorly managed facilities. Impact on landtake is not considered significant on a regional scale. The impact on biodiversity is due to existing sites, which is not considered significant. Landfilling could be energy neutral (however only for larger facilities). Reduces the environmental cost of transporting waste to various other facilities nationally and internationally. Overall landfill is considered unsustainable in the long term – new facilities would be needed with additional footprint costs, also economic and environmental costs related to aftercare. Also high landfill gate fees can result in illegal dumping and backyard burning. **Mitigation** - Facilities to be operated and be managed according to licence conditions, i.e. adequate leachate collection, treatment and disposal. Gas recovery and where possible energy recovery will be implemented at all licenced landfill facilities.

Policy Summary	A: Biodiversity	B: Water	C: Air pollutants	D: Climatic Factors	E/ F: Soil/ landuse	G: Cultural Heritage	H: Landscape	I: Material Assets	J: Human Health	K: Energy	L/M: Transport	Assessment and Mitigation
												- Employ 'Proximity Principle' to the widest extent possible in siting. - Continue remediation work on operating landfills that are unlined. - Restore closed sections of landfills as soon as possible after completion. - Opportunities for habitat restoration and habitat creation should be examined for landfill restoration sites - Provide compensating measures for any habitat damage - For existing facilities protect structures of architectural merit, preserve Architectural Conservation Areas. Site new facilities on non-sensitive sites. - Gate fees and collection charges should not act as an encouragement to illegal dumping or burning of waste.
9. Inter-regional Movement of Waste Policy: The proximity principle should be taken into account however it is recognised that there should be flexibility with respect to the movement of waste across regional boundaries and within the Region.	+	0	0/ ?	0	0/ +	0/ +	0/ +	0/ +	0/ +	0/ +	- /?	This policy will allow more flexibility in relation to movement of waste across waste regions. This will allow waste generated to go to the nearest waste facility where previously waste could not cross between regions. This may also result in rationalisation and co-ordination of facilities across regions. However this policy may result in waste travelling long distances due to cheaper markets. This is not sustainable due to additional transport, energy and associated impacts on the environment. **Mitigation** The proximity principle should always be employed, that is, waste should be treated/ disposed of as close as possible to where it is generated. More rigorous enforcement is required by Local Authorities to ensure no illegal movement of waste. There should be co-ordination between Local Authorities in waste management and enforcement.
10. Closed Landfills Local Authorities will have regard to Section 22(7)(h) of the Waste Management Act, 1996, the Section 60 guidance and the Code of Practice when published by the EPA regarding the investigation of former waste disposal/recovery sites in the Region.	+	+	+	+	+	0	+	+	0	0	0	Investigation of former waste disposal/recovery sites in the region will generally have a positive impact on the environment. For closed sites investigations / risk assessments need to be carried out to determine the risks re: soil, water and air emissions. There will be increased potential for remediation of land to beneficial uses.
11. Former Hazardous Waste Disposal Sites The Local Authorities will ensure that their obligations under the National Hazardous Waste Management Plan are fulfilled regarding former hazardous waste disposal sites in the Region.	+	+	0	+	+	0	+	+	+	0	0	Generally the impacts and mitigation are as above. Overall positive impact as it increases the likelihood that hazardous sites will be investigated and remediated. Appropriate measures will need to be introduced to implement the National Hazardous Waste Management Plan.

Policy Summary	A: Biodiversity	B: Water	C: Air pollutants	D: Climatic Factors	E/ F: Soil/ landuse	G: Cultural Heritage	H: Landscape	I: Material Assets	J: Human Health	K: Energy	L/M: Transport	Assessment and Mitigation
12. Cost Recovery The Local Authorities will seek to improve levels of cost recovery for waste management services in keeping with the 'Polluter Pays Principle'.	+/ -	+/ -	+	+	+	+	+/ -	+	+	+	+	Includes producer responsibility. Will hopefully lead to minimisation of waste generation and need for waste treatment transport and disposal. However indirect negative impacts are possible due to increased incentive to dispose of waste illegally. This includes illegal burning and dumping (See impacts re: uncollected waste)
14. Integrated Waste Structures Local Authorities shall ensure that adequate integrated waste infrastructure to meet Plan targets is put in place and that private waste collection will assist in providing balanced infrastructure such as civic amenity facilities or waste recycling centres.	+	+	+	+	+	+	+	+	+	+	+	Due to the commercial nature of waste collection in the Midlands – difficult to control treatment and disposal of waste to ensure proximity principle and sustainability. Integrated waste facilities will in the long term be more sustainable for waste management.

Assessment Summary

This is an evaluation of the environmental benefits/ disbenefits of implementing the waste policies in the Proposed Plan compared to the current situation.

Negative
The main negative impacts are likely to be due to a further lack or progress in implementing the BPEO and failing to put in place key waste infrastructure (particularly biological and thermal treatment). Due to the timeframe required to put in place thermal treatment there will be a continued reliance on landfill for the majority of waste generated, for at least the next 5 years. Delays with thermal treatment mean landfills will continue to operate with potential for additional land footprint required for disposal. Also the lifespan of landfills will be shorter than if thermal treatment was in place).

Continuation of landfill in the short to medium term without rationalisation, will have a significant negative impact on greenhouse gas emission. With the future introduction of thermal treatment there would be an improvement in greenhouse gas emissions but an increase in emissions of SO_2 and NO_X. Air emissions from thermal treatment have a perceived negative impact on air quality and human health with emissions including dioxins.

Leachate emissions from landfill facilities and composting facilities, which are not correctly designed/ managed. Impact on amenity due to perceived nuisances Odour/dust associated with poorly managed facilities. In engineered facilities nuisance impacts are not significant. Landfill is unsustainable in the long term – new facilities would need additional footprint, although the impact is not considered significant on a regional scale. Continued reliance on landfill and associated high gate fees can result in increased backyard burning and illegal dumping. Landfill economic and environmental costs related to aftercare.

If biological treatment is not provided for landfilling of biodegradable waste will continue, and the requirements of the Landfill Directive will not be met. However there are also possible health and

nuisance impacts due to open air composting (odour and bio-aerosols). Also there are potential impacts regarding emissions, traffic management etc.

With increased waste collection more energy will be required to treat/dispose of additional collected waste. There may also be negative impacts on transport & emissions (air pollutants, greenhouse gases) due to extra journeys. More waste facilities e.g. recycling centres, MRF's and MBT will have local impacts due to noise from operations, traffic, and nuisance. Additional recycling centres may increase no. of individual journeys. MBT will result in increased journeys due to transport of recyclables.

Positive

- Increased prevention, minimisation and reuse will generally have a positive impact. Also increased collection will be positive generally as reduces waste illegally disposed of and reduces associated environmental impacts.
- Less organic waste to landfill would mean less methane emissions, which is positive in terms of global warming
- Contribution to reduction in greenhouse gas and other atmospheric emissions
- Policies will generally not have any significant impact on material assets. Also the impact of waste management policies on cultural heritage due to existing waste management is not a significant issue. Also the impacts on biodiversity due to new facilities will be mitigated using siting criteria.

Uncertain

- Air quality impacts from waste transport are uncertain as current and proposed figures for waste transport (vehicle numbers) are unknown.
- Three-bin system could generate increased waste collection journeys, increased traffic emissions and energy use. However bins could be collected less frequently therefore impact would be negated.
- Extent of impacts on human health and population

Table 9.2: Assessment of Policies for Priority Wastes against Environmental Objectives

Policy Summary	A: Biodiversity	B: Water	C: Air pollutants	D: Climatic Factors	E/ F: Soil/ landuse	G: Cultural Heritage	H: Landscape	I: Material Assets	J: Human Health	K: Energy	L/M: Transport	Assessment and Mitigation
Construction and Demolition (C/D) Waste Policy: To reduce the generation of C/D waste and ensure that it's reuse and recycling is maximised.	0	0	+/ -	+	+	0	+	0	0	+	+/ -	Impacts will be positive through reuse and recycling of C/D waste as this increases diversion from landfill and reduces demand for additional landfill area. Also may reduce extent of unauthorised disposal of C&D waste. Impacts on energy will be positive as less use/ processing of raw materials. Also will have indirect positive impacts on soil/ landuse and landscape as it reduces the demand for additional landfill area. However may be potential for dust or noise when recycling materials. Impacts on transport may be negative as increased no. of journeys through reuse and recycling. **Mitigation** More facilities are required for recycling of C/D waste
Hazardous Waste Policy: The Region needs to ensure that hazardous waste is addressed through an integrated approach of prevention, collection and recycling and development of industry-led producer responsibility for key waste streams.	+	+	+	0	+	0	0	0	+	0	+/ -	Prevention of hazardous waste and prevention to landfill will have a positive impact as it decreases potential impact due to leachate contamination as less hazardous contaminants. Also will reduce potential harmful emissions to air (VOCS etc.) Also less risk of soil contamination. Positive impacts also on health and population. Prevention will have a positive impact on transport as less waste is generated, therefore less journeys. Depends on if separate hazardous waste collection. **Mitigation** There should be increased provision for hazardous waste collection (batteries, waste oil etc.) from households and small business.
Waste Electrical & Electronic Equipment (WEEE) Policy: The Local Authorities shall maximise the collection, reuse and recycling opportunities for all WEEE in the Region over the Plan period.	+	+	+/ -	+	+	0	+	0	0	_	+/ -	Positive impact as increases diversion from landfill. This is provided no additional land area required for storage facilities. Also less potential for contaminants to water from WEEE materials, which can be hazardous. However may be additional journeys generated with associated emissions but not considered significant. Positive re air quality as minimises WEEE to landfill, which will reduce potential harmful emissions (CFC's etc.). Also less potential for soil contamination arising from WEEE materials when landfilled or illegally dumped. Landuse/ landscape positive as reduces illegal dumping of WEEE items. Energy cost to recycle and process, but also energy savings as less need for raw materials for products. Increased journeys through additional collection and recovery facilities for WEE. **Mitigation** There should be full implementation of the WEEE Directive. Provide adequate collection facilities.
End of Life Vehicles Policy: To ensure that ELVs are dismantled and recovered in a manner which do not cause environmental pollution and ensuring that the recycling and recovery rates of ELVs and their components are met.	+	+	+	+	+	0	+	0	+	+ /-	+ /-	Positive impact as increases diversion from landfills and minimises ELVs to landfill. Also positive as reduces illegal dumping of WEEE items, positive re: soil, landscape etc. Minimising the use of hazardous materials/substances in vehicles will minimise hazardous materials and the impact on the environment and minimise potential risk to human health. Also will reduce potential harmful emissions. Also if use of recycled materials, this minimises production of new raw materials reducing air emissions. However may be additional journeys generated. Collection/ dismantling systems could have negative impact if additional land area/ buildings required. Energy cost to recycle and process (re-smelting etc.), but also energy saving as less need for raw materials for products

Policy Summary	A: Biodiversity	B: Water	C: Air pollutants	D: Climatic Factors	E/ F: Soil/ landuse	G: Cultural Heritage	H: Landscape	I: Material Assets	J: Human Health	K: Energy	L/M: Transport	Assessment and Mitigation
												Mitigation There should be full implementation of the ELV legislation. Provide adequate collection facilities
Tyres Policy: Minimise illegal disposal of waste tyres and increase the quantity of tyre recycling.	0	0	0	0	+	0	+	0	0	+	0	No significant environmental impact.
Sludges Policy: Implement policy as stated in each Sludge Management Plan.	+	+/ -	0	0	+	0	0	0	0	+	0	No significant environmental impact.

Table 9.3: Cumulative Impacts and Interactions

Environmental Receptor	Cumulative Effects of the Plan on Environmental Receptors	Interactions with	Details of Potential Interactions
Biodiversity, Flora and Fauna	Main impact due to expansion of existing and new facilities. Cumulative impact not considered significant if mitigation.	Water, Population, Soils / landuse, Landscape	Habitat loss can impact on the local community in terms of loss of amenity.
Water (Includes surface, groundwater quality & quantity)	The cumulative impacts are mainly due to expansion of existing landfill facilities and new composting & waste transfer facilities. Impact depends on how many new facilities are proposed or their locations, i.e. proximity to watercourses.	Biodiversity, Flora & Fauna, Human Health, Soils and Geology, Material Assets	Aquatic flora and fauna are dependent on water quantity and quality for survival. Contamination of water supplies for drinking would impact on health. Run off or seepage from contaminated land due to waste can cause contamination of water. Water quality is important for fishing, amenity etc.
Air	The cumulative impact on air quality is considered significant. Continuation of landfill will have a negative impact on greenhouse gas emission. High landfill gate fees can result in increased backyard burning. Air quality impacts from waste transport are uncertain as current and proposed levels of waste transport (vehicle numbers) are unknown.	Climate, Population, Human Health, Transport, Biodiversity	Air quality is a major concern both at the local community level and on a broader national/global scale. Reductions in air quality e.g. by dioxins could also impact on human health. Sensitive receptors located close to facilities may experience some increase in noise, dust or odour levels. These can also impact on bird and animal life.
Climatic Factors	The cumulative impact on climate is mainly due to continuation of landfill in the short to medium term, which has a negative impact on greenhouse gas emission.	Air, Energy Efficiency, Transport	Factors influencing climate interact with Air due to emissions from facilities and waste transport. Also increased energy use and transport increases use of fossil fuels with higher CO_2 emissions.

Environmental Receptor	Cumulative Effects of the Plan on Environmental Receptors	Interactions with	Details of Potential Interactions
Soils/ Landuse	The cumulative impact on soils landuse due to all waste facilities is not considered significant on a regional scale. The main impact is due to continued plus new landfill sites. Other waste facilities are small in comparison.	Biodiversity, Flora & Fauna, Material Assets, Population, Landscape, Cultural Heritage	With landtake this can include the loss of ecological habitat and farmland and can impact on landscape. There may be potential for undiscovered archaeology.
Landscape	The cumulative impact on landscape is not considered significant as the major facilities are dispersed through the region. Existing facilities do not have significant impact on designated areas of high amenity. Also	Population, Material Assets, Soils/ Landuse, Biodiversity, Flora & Fauna,	Impacts on landscape can directly impact on the local community /adjacent residences, landuse and biodiversity e.g. by habitat loss. However restoration of landfills and landscaping will greatly improve the landscape for the community and for biodiversity and landuse.
Cultural Heritage including architectural and archaeological heritage	Provided mitigation measures are followed and siting criteria for new sites the cumulative impacts on cultural heritage will be not significant.		Cultural features have landscape significance and also influence the surrounding landscape
Material Assets	The cumulative impact on material assets is not considered significant.	Soils/ Landuse, Population	Material assets interact
Population	Cumulative impact on community depends on location of proposed facilities. Impact due to existing facilities is not significant. With mitigation, impact on proposed facilities if properly designed and managed will be not significant.	Human Health, Water, Air, Transport, Landscape	Population refers generally to human beings an there are interactions in relation to impacts on health (including indirectly from air and water), impacts on landscape and amenity. Also see transport.
Human Health	Air emissions from thermal treatment have a perceived negative impact on air quality and human health with emissions including dioxins. There are possible health and nuisance impacts due to open air composting and bio-aerosols.	Water, Air, Population	See Water, Air and Population above
Energy Efficiency	Increased waste collection more energy will be required to treat/dispose of additional waste. Less organic waste to landfill would mean less methane emissions, which is positive in terms of global warming, however there would be less potential for energy recovery.	Climate, Air.	Improved energy efficiency or energy recovery can decrease greenhouse gas emissions to air due to reducing or replacing consumption of fossil fuels.
Transport	Impacts uncertain as current and proposed figures for waste transport (vehicle numbers) are unknown. Increased waste collection, Three-bin system, additional recycling centres and MBT could generate increased journeys.	Climate, Air, population.	Transport generates CO_2 emissions which is a greenhouse gas. Traffic emissions are also a major cause of air pollution (mainly NO_2, PM_{10}, ozone and carbon monoxide). Transport also interacts with human beings due to air quality, noise and dust impacts and the potential for accidents.
Overall Cumulative Impact	Individual locations where there are likely to be cumulative impacts will be in the vicinity of significant waste facilities. In relation to human beings and population the cumulative impacts would be mainly due to noise, dust, visual, nuisance, traffic and material assets. In relation to the environment the cumulative impacts would be mainly due to the combination of water, biodiversity, air quality, and climate. The cumulative impacts due to existing waste facilities are considered not to be significant. The cumulative impacts due to proposed facilities couldn't be fully assessed as these locations are not known. These impacts will be assessed at individual facility (EIS) level.		

9.10 ENVIRONMENTAL SITING CRITERIA

9.10.1 Introduction

General siting criteria are given below to mitigate potential impacts due to the location and operation of new waste management facilities. There are no national guidelines regarding the selection of areas suitable waste facilities, however the following are based on The Landfill Directive and other relevant legislation. The following criteria should be taken into consideration when selection locations for waste facilities: -

9.10.2 Recycling Centres/Materials Recovery Facilities

There are no national or international guidelines on the siting of such facilities.

Recycling Centres / Material Recovery Facilities
The siting of such facilities should have regard to the following site selection criteria: ▪ *The facility to be placed within an urban area or as near as possible* ▪ *If development zoning exists an area zoned as industrial is preferable* ▪ *Location of facility to be convenient to majority of householders* ▪ *Avoid European and National proposed, candidate and designated sites* ▪ *Particular regard to be had to traffic considerations* ▪ *Brownfield sites are preferable to greenfield sites if available* ▪ *Particular regard to be had to the proximity of waterways and waterbodies* ▪ *Areas of high amenity or high archaeological interest (international, national or regional interest) should be avoided*

9.10.3 Biological Treatment Facilities

The primary pieces of legislation referring to biological treatment facilities are The Waste Management Act 1996, Working Document- Biological Treatment of Biowaste (2nd Draft)* and Animal By-products Directive (1774/2002/EC).

*Annex V sets out a number of criteria that should be considered when selecting a composting site. These are as follows:-

- Location, taking into account requirements relating to the feedstock waste and technology used;
- Distance to residential and recreational areas;
- The proximity of waterways, waterbodies and other agricultural and urban sites;
- The existence of protection zones in the area and the protection of the local environment;

The Animal By-products Directive, which has come into force, also includes criteria for siting of composting and biogas (Anaerobic Digestion) plants that treat animal by-products. Food waste from municipal sources is designated as animal by-products.

- Composting/biogas plants cannot be located within the confines of a premises/ farm where farmed animals are kept. There must be total physical separation between the plant and any surrounding farmlands, with a separate entrance and exit to the facility.

- The biogas/ compost facility must be located at a minimum distance of 50 metres on all sides from the nearest premises or location where farmed animals are kept. This distance may be reduced where appropriate alternative barriers exist.

- In the case of an existing site where a border of 50 metres is not possible, equivalent measures against farmed animal contact must be in place. This could involve the provision of specific exclusion arrangements and/or special access/ egress systems at the facility.

- In order to prevent the possibility of contact with farm animals either directly or indirectly (vermin, birds etc), all processing of raw material must be carried out under cover.

Biological Treatment Facilities
The siting of such facilities should have regard to the following site exclusionary factors: ▪ *European and National proposed, candidate and designated sites* ▪ *Areas of high amenity or high archaeological interest (international, national or regional interest)* ▪ *Particular regard to be had to proximity of waterways and waterbodies* ▪ *Proximity to Residential, recreational areas and sensitive sites (schools, hospitals etc);* ▪ *If development zoning exists an area zoned as industrial is preferable.* ▪ *Particular regard to be had to traffic considerations* ▪ *Brownfield sites are preferable if available*

9.10.4 Waste to Energy Facilities

As thermal treatment of municipal waste is not an established technology in Ireland there are no national guidelines regarding the selection of areas suitable for the location of waste to energy facilities.

Waste to Energy Facilities
A sieving process is recommended whereby exclusionary factors, which may preclude the siting of a Thermal Treatment plant, should be considered. This would include the following:- ▪ *Appropriate zoning based on the County Development Plans* ▪ *European and National proposed, candidate and designated sites* ▪ *Airport Exclusionary Areas* ▪ *Areas of High Amenity or Archaeological Interest (international, national or regional interest)*

Having identified areas which are not suitable to locate a facility more detailed assessment can be carried out having regard to the following criteria:

- *General Planning and Environmental Considerations*
- *Sensitive sites (schools, hospitals etc.)*
- *Site Size and Current Land Use*
- *Proximity to Residential Areas*
- *End-Market Use*
- *Road Access*
- *Traffic*

Legislation as follows should also be considered:-

- Council Directive on the Incineration of Waste, 2000
- The Waste Management Act, 1996

9.10.5 Landfills

Landfills

Landfill site locations should be selected having regard to the following exclusionary factors:

- *Regionally important aquifers*
- *European and National proposed, candidate and designated sites.*
- *Geologically unsuitable areas*
- *Areas of high amenity or high archaeological interest (international, national or regional interest)*
- *Airports*
- *Floodplains*
- *Proximity to Residential, recreational areas and sensitive sites (schools, hospitals);*
- *Have regard to proximity to waterways and waterbodies*

10 PROPOSALS FOR MONITORING

10.1 INTRODUCTION

Article 10 of the SEA Directive requires that monitoring should be carried out in order to identify at an early stage any unforeseen adverse effects due to implementation of the Plan, and to be able to take remedial action. Monitoring is carried out by reporting on a set of indicators, which enable positive and negative impacts on the environment to be measured. They have been developed to show changes that would be attributable to implementation of the Plan.

The indicators have been geared towards existing waste facilities. For new or proposed facilities with implementation of the recommended siting criteria it is expected that these would avoid or reduce the potential for negative environmental impacts.

10.2 ENVIRONMENTAL PROTECTION INDICATORS

The monitoring has been focussed on aspects of the environment that are likely to be significantly impacted by the Plan. These Primary Indictors (for Water, Air Quality, Climate and Transport n) are outlined in **Table 10.1.** The remaining indicators, referred to as Secondary Indicators are outlined in **Table 10.2**.

The indicators take account of existing monitoring networks where possible, to avoid duplication. The existing monitoring is carried out either by the licenced facility, Local Authorities or by other Government Agencies. For landfills and licenced facilities Annual Environmental Reports (AER's) are a useful tool as they report on ongoing monitoring carried out as part of the licence conditions. Also as part of the Waste Plan the Regions are now required to compile an Annual Waste Report that will outline what progress has been made in relation to the policy targets. This will be a key source of information for the indicators below.

A detailed monitoring programme (including frequency of monitoring, reporting and responsibilities) will be included in the SEA Statement.

Table 10.1: Primary Environmental Indicators

Environmental Receptor	Indicator	Source
Water (including surface, groundwater, drinking, aquifers and bathing)	- Number of licence exceedances for emissions to water - Biological & chemical status up and downstream of facility - WFD monitoring results for waterbodies impacted by waste facilities - Results of risk assessment for closed facilities	-AER/ EPA data -AER/ Local Authority/ EPA water quality data -Local Authority
Air	- Number of licence exceedances for dust and noise - No. of households with a waste collection service - Estimated tonnes of waste uncollected - Amount of energy captured from waste facilities	-AER - Local Authority /AER
Climatic Factors	- Estimate of landfill gases (CO_2 and methane) emitted/year from facilities - Tonnes of waste recycled, landfilled and thermally treated	-AER/ Local Authority -Local Authority/ Annual Report/
Transport	- No. of waste generated journeys or km travelled - Proximity of waste facilities to centres of population - Amount of waste generated (success of waste minimisation) - No. of households with home composting	-may not be available -Local Authority, CSO -Local Authority -Local Authority

Table 10.2: Secondary Environmental Indicators

Environmental Receptor	Indicator	Source
Biodiversity, flora and fauna	- Proximity of new facilities to designated areas - Area and % of designated habitat damaged due to waste management facilities	-Site EIS/AER/ DoEHLG -Site EIS/otherwise may not be availbale
Soil/ Landuse	- Area of land occupied by ceased and existing waste activities (Total area and greenfield area) - Location of new facilities - Area of land contaminated due to waste activities - Area of contaminated land restored for beneficial use	-AER, Local Authority -AER -Local Authority -Local Authority
Cultural heritage including architectural and archaeological heritage	- Location of new facilities in relation to sites of cultural heritage including architectural and archaeological heritage - Number of sites / settings of cultural importance at risk due to waste facilities.	-site EIS/AERs/ DoEHLG -site EIS/AERs /DoEHLG
Landscape	- Number of high amenity areas impacted by waste facilities - Area of land restored for beneficial use - Number of reports of unauthorised waste activities and fly-tipping	-Site EIS/AER, County Development Plans -EPA/Local Authority -AER/Local Authority
Population and Human Health	- No. of reported accidental releases from waste activities - No. of complaints and incidents re: nuisance, noise and odour from waste activities - Proximity of new facilities to centres of population	-AER/Local Authority -AER/ Local Authority -Site EIS/ AER
Material Assets	- Area of land occupied by waste activities	-AER
Energy	- No. of landfills facilities with energy recovery - Amount of energy captured from waste facilities	-AER -AER

It should be noted that this information is more than likely only available for larger facilities that are covered by waste licences. However these are considered to have a greater potential for environmental impact.

10.3 PERFORMANCE (SERVICE) INDICATORS

Implementation of policies in the Waste Plan will be through a phased approach, with key objectives specified for each year of the plan duration. Realistic targets and indicators are set to measure policy implementation and ultimately to establish whether targets are being met.

A set of service indicators relating directly to waste is taken from the Waste Plan. These are a subset of the 42 service indicators launched in 2004 “Delivering Value for People”, to measure the performance of local authorities. These relate to the area of waste management, litter prevention and environmental enforcement and Local Authorities are obligated to report annually on performance using these indicators. These will form the basis for annual reporting on progress on the implementation of the Waste Management Plans (**Table 10.2**).

Table 10.2: Service Indicators

Waste Management	Environmental Enforcement
• Percentage of households provided with segregated waste collection	• No. of Complaints (waste, litter, water, noise, and air pollution)
• Percentage of household waste recycled	• No. of complaints investigated • No. of complaints dismissed
• Percentage of household waste going to landfill	• No. of enforcement procedures taken.
• Recycling Facilities: • No. of Bring sites, Civic Amenity Sites (Recycling Centres) per 5,000 population • Tonnage of waste pre 5,000 population collected for recycling	• Implementation of Environmental Campaigns in primary and secondary schools

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 GENERAL

At this stage of the Strategic Environmental Assessment and the Proposed Replacement Waste Plan, conclusions and recommendations are made with regard to policies that should be included in the Replacement Waste Plan. This follows a review of the environmental costs or impacts associated with the waste management hierarchy and the progress towards achieving the targets set in the 2001 Waste Plan.

With the exception of waste prevention/minimisation and a small number of reuse options, all waste management options generate a degree of negative environmental impact or cost. It is impracticable in the short to medium term (and even in the long term) to achieve “Zero Waste”, i.e. 100% waste prevention or even 100% diversion of waste from landfill disposal. Thus it must be accepted that there is an economic and environmental cost to the management of that waste. The objective of national and regional waste management policies is to minimise that cost as far as is practicable by encouraging the prevention of waste at source and by providing an efficient collection system and treatment, recovery and disposal facilities in locations where they will have the least environmental cost.

Since the Waste Plan was adopted in 2001 there has been a lack of progress in developing major waste infrastructure in the Midlands region. These issues need to be addressed in order to achieve the national waste targets set by the government for 2013. Waste management infrastructure including biological and thermal treatment facilities need to be put in place as a matter of urgency.

11.2 WASTE PREVENTION AND MINIMISATION

Policies in the Waste Plan relating to the higher end of the waste hierarchy (prevention, minimisation and most reuse options) support all of the environmental objectives and have no environmental cost.

- *It is recommended that there should be a major emphasis in the Plan on implementation of waste prevention/minimisation policies.*

- *It is further recommended that an indicator of waste reduction/minimisation be identified in the Plan and monitored on a regular basis to establish the success or otherwise of measures proposed in the plan to reduce/minimise the waste generated in the Midlands.*

11.3 CO-ORDINATION OF WASTE MANAGEMENT, COLLECTION AND TREATMENT

The exact costs of waste management can only be determined when the source, collection, treatment and final disposal method and destination for all wastes generated in the region is determined.

The provision of waste management services and facilities in the Midlands appears to be largely driven by private commercial enterprises. This does not facilitate the co-ordination of sustainable management of waste in the Region or the provision of the required facilities. A more proactive approach to directing the management of waste and the provision of facilities to recycle or treat waste might yield a more sustainable management system for the future. Further emphasis may be needed on the regulation of the ultimate destination of waste generated and collected in the region. There needs to be a co-ordinated and integrated approach ain relation to waste collection, to avoid duplication and reduce the number of collection journeys.

- *It is recommended that the Plan should provide policies and strategies on comprehensive auditing and control of waste management activities in the region.*

- *The issues of the level of waste collection charges, waste facility gate fees etc. are largely outside the brief of the SEA. However, collection charges should not act as an encouragement to illegal dumping or burning of waste.*

- *There should be mechanisms for monitoring implementation of the Waste Plan during its lifetime. This would allow progress or lack of progress to be reviewed and acted upon as early as possible within the timescale of the Plan.*

11.4 THE RECOVERY OF WASTE BY REUSE AND RECYCLING

There are a significant number of technologies, which could be used to process/treat waste generated in the Midlands depending on the nature of the waste and the method of collection. However, to date few of these technologies are available at a regional or national scale.

Reuse

While reuse of material may have some environmental cost in terms of collection and cleaning it is a relatively cheap form of waste management. However, little initiative has been taken on developing policies on reuse in the Midlands to date.

- *It is recommended that the concept of reuse be further investigated in terms of the feasibility of implementing reuse schemes in the Midlands. This should be co-ordinated with a national effort to encourage reuse.*

Recycling

Environmental costs associated with recycling include energy use and emissions related to transportation and reprocessing of materials and the disposal of the residuals of the process.

The current emphasis on recycling regionally and nationally is on the collecting and sorting of recyclables. However, with the exception of the processing/treatment of construction and demolition waste, most of the recovery and reprocessing of materials is undertaken outside the country and the environmental costs associated with those processes are removed from the source of the waste generation. This practice is contrary to the proximity principle laid down in EU Waste Management Policy. While there are considerable databases on waste permits and licences to collect different types of recyclable wastes, little is known about reprocessing and where it takes place.

The sustainability of continuing these practices needs to be investigated in terms of the environmental costs and how these are being managed at a regional and national scale. The environmental cost of collecting, separating and reprocessing/treating and disposal of the various waste streams separately should also be investigated relative to the cost of a single collection and treatment/disposal method, particularly given the current lack of availability of national or regional facilities.

More emphasis should be given to the provision of recycling process facilities and outlets for recovered materials on a regional and national level. However, it is recognised that the principles of economies of scale must be taken into consideration when determining the most sustainable options.

- *The Midland Local Authorities should look at the possibility of implementing a pilot initiative in the region to provide for glass bottle returns. This could be carried out in conjunction with e.g. a drinks manufacturing company and if successful could be developed as a national initiative. The Local Authorities should also encourage a national initiative to provide recycling processing facilities within the state.*

- *It is recommended that an audit of the current routing, destinations and processing of recyclables collected in the Midlands be undertaken to determine the environmental benefit of current operations. It is also recommended that a similar audit be under-taken at a national level by the relevant authorities.*

- *It is further recommended that national objectives be set for the establishment of national recycling process facilities where such facilities can be sustainable. Also national guidance should be developed on environmentally sustainable routing, destination, processing and disposal of residual materials collected in the Republic of Ireland.*

11.5 BIOLOGICAL TREATMENT

It is National and EU waste management policy to divert 50% of biodegradable municipal waste from landfill by 2009. While the development of biological treatment facilities to treat organic wastes was an objective of the 2001 Midlands Plan, no facility has been provided in the region.

Composting and Anaerobic Digestion are the most common forms of biological treatment available for organic wastes while Mechanical Biological Treatment is available for the treatment of biodegradable wastes. Facilities that have been established in other regions have met with resistance from the public due to actual or perceived impact in relation to airborne emissions and traffic generation.

Home composting can provide a significant method for treating organic wastes at source and can minimise the amount of domestic organic waste going for other forms of treatment or disposal.

- *It is recommended that the implementation of the policies identified in the Plan for the provision of segregated collection systems and the provision of processing/treatment facilities for organic waste be actively encourage by Local Authorities in the Region either through the provision of incentives for private developers or by the provision of facilities by the Authorities themselves.*

- *It is recommended that the identified siting criteria be adhered to for these facilities.*

- *It is recommended that a national/ inter-regional study be undertaken to identify markets for the end products of such facilities.*

- *The Midlands Local Authorities should actively encourage the use of home composting through the provision of incentives.*

11.6 ENERGY RECOVERY

Energy recovery through the thermal treatment of waste has been adopted as national policy. The provision of an energy recovery facility in the Midlands was an objective of the Waste Plan adopted in 2001 and was a key element of the Best Practical Environmental Option for managing waste in the region.

However, no such facility has been developed in the intervening period at a regional or national level although a facility to be located in the north-east region now has planning permission and a Draft EPA licence. Without the availability of such a facility to the Midland Region, the targets set in the 2001 Plan for the diversion of waste from landfill are unlikely to be achieved.

The main environmental benefits to be gained through the thermal treatment of waste are the production of heat, which can be used directly or as a source to generate electricity thus replacing

fossil fuel as a source, and the large scale and significant reduction in the bulk of waste for disposal. In terms of the footprint of a waste facility, a waste to energy facility is significantly more efficient than any other form of waste process/treatment.

In order to make the most efficient use of the heat generated, a thermal treatment facility would ideally be located near a large centre of population. Such a location is likely to cause concern among people living in its vicinity due to perceived health risks from such facilities and hazard from traffic accessing the facility. It must be noted however, that many of the thermal treatment facilities operating successfully in Europe are located in large population centres. Any thermal treatment facility would be licensed by the EPA and the terms of that licence adhered to during its operation.

- *It is recommended that the Midlands Local Authorities actively pursue the procurement of a thermal treatment facility for the Midlands or liaise with adjacent regions to ensure the procurement of a joint facility, as one measure in a suite of measures to reduce the amount of waste currently being disposed of in landfills in the Region.*

- *Siting criteria identified in this report for the siting of such a facility be adhered to.*

11.7 DISPOSAL (LANDFILL)

Disposal to landfill is the least favoured option in the waste management hierarchy but is currently the only major waste management option in the region for municipal waste. The objective set in the 1999-2004 Waste Plan to close all but one landfill in the region has not been realised due to the lack of a thermal treatment facility. None of the current facilities have energy recovery and thus their operation has a net cost in terms of energy usage and $C0_2$/methane emissions, however it is not viable to have energy recovery at many sites due to their size.

Current capacity in existing landfills will be sufficient to cater for waste generated in the region until 2011 but additional space will be needed if no alternative management option is available by that date. This would result in an increase in the footprint of landfills in the region with resultant loss of habitat and alternative uses for that footprint.

- *It is recommended that the Midlands Local Authorities actively peruse the implementation of the objective set in the 1999-2004 Waste Plan to provide alternative waste management facilities in order to minimise waste to landfill. It is further recommended that the objective of upgrading existing facilities in order to minimise their environmental impact be implemented. This objective should also be perused in relation to landfills that have already been closed.*

- *It is recommended that in the event that additional landfill capacity is required in order to cater for the disposal of waste until alternative management options can be commissioned, the siting criteria for landfills identified in this report should be adhered to.*

11.8 OVERALL CONCLUSIONS AND RECOMMENDATIONS

- *With the exception of polices on the collection of wastes for recycling and disposal, few of the policies identified in the original Waste Plan for the region have been achieved in the intervening period. These issues need to be addressed in order to achieve the national targets set by the government for 2013. Waste management infrastructure including biological and thermal treatment needs to be put in place as a matter of urgency.*

- *It is recommended the waste management hierarchy identified at EU and national level be rigorously implemented in the Midlands Region in order to minimise the impact of waste*

management on the environment. The emphasis of this implementation should be at the upper level of the hierarchy and that an indicator of waste prevention/minimisation be identified and monitored on an annual basis. The policy to explore mechanisms for directing waste to treatment methods in line with the hierarchy would tie in with this recommendation.

- *There should be adequate mechanisms for monitoring of implementation of the Waste Plan during its lifetime. This would allow progress or lack of progress to be reviewed and acted upon as early as possible within the timescale of the Plan.*

- *Wastes generated in the region should be managed in an integrated and sustainable way, to minimise impacts on the environment. There needs to be a co-ordinated approach in relation to waste collection in particular.*

- *It is further recommended that the procurement of the waste management options identified in the Best Practical Environmental Option developed in the original Waste Plan be actively pursued, directed and co-ordinated by the Local Authorities rather than relying on the commercial waste market to provide these facilities.*

- *In addition it is recommended national initiatives be undertaken in relation to investigating the feasibility of reuse schemes and procuring recyclables processing facilities at a national level where sustainable and where this is not sustainable, providing guidance on environmentally sustainable routing and processing options at an international level.*

This Environmental Report is the first stage in an iterative process being carried out in tandem with the development of the Proposed Replacement Midlands Waste Management Plan. A two-month consultation period will follow on the Plan and the Pilot (non-statutory) SEA.

An SEA Statement will be prepared following the two-month consultation period. This document will include a summary of how the Environmental Report and submissions from the consultation process have been taken into account in the Replacement Waste Management Plan. The Plan, when adopted, will be the Waste Management Plan for the Midlands Region for the next 5 years (2005-2010).

GLOSSARY OF TERMS

Anaerobic Digestion: the biological decomposition of biowaste in the absence of oxygen and under controlled conditions in order to produce biogas and a liquid, digestate.

Best Practicable Environmental Option (BPEO): the outcome of a systematic procedure for establishing the option (for waste management) that provides the most benefits or least damage to the environment as a whole, at an acceptable cost.

Biodegradable Content: the percentage content of waste, which is biodegradable. For municipal waste this usually fluctuates around 60%-70%.

Biodegradable Municipal Waste (Biowaste): municipal waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard.

Biological Treatment: involves composting, anaerobic digestion, mechanical/ biological treatment or any other process for stabilising and sanitising biodegradable waste.

Bring Banks: these are facilities in which members of the public deposit recyclable waste materials such as paper, glass, green waste and plastics in material specific receptacles for subsequent collection and delivery to material recovery facilities.

Central Composting Facility: a facility at which the biodegradable waste is delivered to be processed by composting into a compost product – can be for green (garden waste) food waste or a combination of both materials.

Civic Amenity Facilities: a reception facility that enables householders to deposit a wide range of household waste including recyclable and non-recyclable materials, bulky household waste and certain categories of household hazardous waste

Collection System: a system of gathering, sorting or mixing of waste for the purpose of it being transported to a waste recovery or disposal facility.

Commercial Waste: waste from premises used wholly or mainly for the purposes of a trade or business or for the purposes of sport, recreation, education or entertainment but does not include household, agricultural or industrial waste.

Compost: the stable, sanitised and humus-like material rich in organic matter and free from offensive odours resulting from the composting process of separately collected biowaste.

Composting: the biological decomposition of separately collected biowaste in the presence of oxygen in order to produce compost.

Environmental Baseline: The current condition of those elements of the environment, which are likely to be significantly affected by a plan, and likely change in the future without the plan.

Expert Judgement: The formal opinion of a suitably qualified person on a particular matter, sometimes used as a qualitative assessment method in SEA.

Hazardous waste is composed of discarded substances that can threaten human health and the environment. A waste is hazardous if it corrodes (wears away) other materials; explodes; ignites

easily; reacts strongly with water; or is poisonous. Types of household hazardous waste include: paints, solvents, fluorescent tubes, lubricating oils, cleaners, glues, medicines and batteries.

Home Composting: a process whereby biowaste is composted and used in gardens belonging to private households.

Household Waste: the waste produced within the grounds of a building or self-contained part of a building used for the purposes of living accommodation.

Groundwater: This is water, which permeates the fissures and pores in rock and soil below the land surface.

Integrated Waste Management: A strategy for managing waste in an environmentally sound way so as to promote techniques at the top of the waste hierarchy.

Incineration: a process by which heat is applied to waste in order to reduce its bulk, prior to final disposal which may or may not involve energy recovery.

In-Vessel Composting: the composting of biowaste in a closed reactor where the process is accelerated by controlled and optimised air exchange, water content and temperature control.

Kerbside Collections: entail waste collectors collecting a range of recyclable waste from outside private households, employing separate bins for the main waste streams (usually dry recyclables, organic waste, and residual waste).

Landfilling: the disposing of waste at a waste disposal facility used for the depositing of waste onto or under the land.

Landfill Directive: a Directive which aims to, by means of stringent operational and technical requirements on the landfilling of waste, to implement measures, procedures and guidance to prevent or reduce as far as possible negative effects on the environment.

Landfill Gas: Created by the decomposition of putrescible wastes in landfill sites. The gas is predominantly methane (65%) and carbon dioxide (35%) with traces of other gases present.

Leachate: Liquid seepage which is contaminated by the decomposition of putrescible waste in landfill sites.

Material Recovery Facilities: facilities where recyclables are sorted into specific categories and processed, or further transported to processors for remanufacturing.

Mechanical Biological Treatment: the treatment of residual municipal waste, in order to stabilise and reduce the volume of waste to be disposed off. A combination of mechanical processing and biological breakdown are employed.

Mitigation: Avoiding, reducing, remedying or compensating for potential adverse impacts.

Municipal Waste: waste from households, as well as commercial and other waste, which because of its nature or composition, is similar to waste from households.

Pay By Weight: scheme whereby resident's pay for the amount of waste collected per household. This scheme is devised to offer financial incentives for residents to reduce the amount of waste to be collected and disposed off by public or private waste collectors.

Polluter Pays Principle: the principle set out in Council Recommendation 75/436/Euratom, ECSC, EEC of 3rd March 1975 1(20) regarding cost allocation and action by public authorities on environmental matters.

Producer Responsibility Initiatives: a series of initiatives undertaken by the Government to facilitate better management of priority waste streams, in line with the 'Polluter Pays Principle'.

Proximity Principle: The minimisation of transport distances, and therefore environmental and economic cost, by situating waste management facilities near to the source of waste arising.

Recovery: any activity carried out for the purpose of reclaiming, recycling or re-using waste in whole or in part.

Recyclables: waste materials that may be subjected to any process or treatment to make it re-useable in whole or in part**.**

Refuse derived fuel: Fuel, often in pellet form, which is produced from the combustible elements of household and commercial waste, and used in industrial boilers to produce energy.

Recycling: the subjection of waste to any process or treatment to make it re-useable in whole or in part**.**

Residual Municipal Waste: the fraction of municipal waste remaining after the source separation of municipal waste fractions, such as food and garden waste, packaging, paper and paperboard, metals, glass and is usually unsuitable for recovery or recycling.

Residue: The resultant product after waste has undergone a particular treatment processes.

Reuse: This is the process of re-using potential 'waste' in a repeat function of its primary purpose, for example the collection and reuse of glass bottles.

Risk Assessment: An assessment of the probability and severity of harm likely to occur to an individual, community, ecosystem, or other receptor, and the consequences thereof.

River Basin Management Plan (RBMP): Plans required by the Water Framework Directive to be prepared by the Agency to achieve "good status" of water bodies.

Separate Collection: the separate collection of biodegradable waste from municipal waste in such a way as to avoid the different waste fractions or waste components from being mixed, combined or contaminated with other potentially polluting wastes, products or materials.

Special Protection Area (SPA): A site for international conservation, which has been classified under the 1979 EC Council Directive on the Conservation of Wild Birds. Such sites afford the highest level of European protection for certain rare species and migratory species of wild bird.

Special Area of Conservation (SAC): A site for international conservation, which has been designated under the 1992 EC Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora. Such sites afford the highest level of European protection to maintain or restore natural habitats and wild species at a favourable conservation status.

Thermal Treatment: a process by which heat is applied to waste in order to reduce its bulk, prior to final disposal. Thermal treatment can involve a number of processes such as incineration, pyrolysis and gasification.

Treatment Facilities: facilities where waste undergoes thermal, physical, chemical or biological processes that change the characteristics of waste in order to reduce its volume or hazardous nature or facilitate its handling, disposal or recovery.

Waste: any substance or object which the holder discards, or intends, or is required to discard, and anything which is discarded as if it were a waste, as per the Waste Management Act, 1996.

Waste Management Facility: a site or premises used for waste storage, treatment, processing, collection, separation, recycling, recovery or disposal.

Waste Management Plans: statutory waste management plans implemented on a Regional basis in Ireland since 2001.

Waste Minimisation: any technique, process or activity that either avoids, reduces or eliminates waste at its source, or results in re-use or recycling.

Waste Prevention: A reduction in the quantity and harmfulness to the environment of waste and the materials and substances contained within waste.

Waste to Energy Plant: a plant where waste undergoes thermal treatment with a recovery of energy due to the fact that the waste itself contains large amounts of thermal energy ready to be liberated either by combustion or by synthesis gas production followed by combustion. The energy that is recovered is often used to supply electricity.

Waste Transfer Station: A site used for transferring waste from small receptacles into larger ones before sending it for final disposal. Waste is not disposed of at waste transfer stations.

Waste Hierarchy: Hierarchical ranking of waste management options based on their relative environmental benefits; waste prevention, minimisation, re-use, recovery, and disposal.

Water Framework Directive (WFD): An EU Directive to establish a new integrated approach to the protection, improvement and sustainable use of surface and groundwater in Europe, based on restoring good ecological and chemical status to water bodies.

Windrow Composting: the composting of biowaste placed in elongated rows which are periodically turned by mechanical means in order to increase the porosity of the heap and increase the homogeneity of the waste.

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www.sei.ie,	Sustainable Energy Ireland
www.cso.ie	Central Statistics Office
www.environ.ie.	Department of the Environment, Heritage and Local Government.
http://www.sei.ie	Irish Energy Centre 2001
www.npws.ie	National Parks and Wildlife Service
www.wfdireland.ie	Water Framework Directive

APPENDIX A

ADDITIONAL BASELINE INFORMATION

WATER QUALITY

The biological river quality or Q rating ranges from 5 to 1, Q value 5 being water of the highest quality. The quality referred to by the 'Q value' mainly reflects the effects of biodegradable organic waste but toxic effects are also recorded. Below illustrates the ranking in the 'Q value' system.

Table A1: EPA Water Quality Classifications

Biotic Index or 'Q value'	Quality Status	Quality Class
Q5, 4-5, 4	Unpolluted	Class A
Q3-4	Slightly Polluted	Class B
Q3, 2-3	Moderately Polluted	Class C
Q2, 1-2, 1	Seriously Polluted	Class D

The current water quality of the principal rivers is given below;

- **River Inny**: Agriculture and sewage are suspected as the primary sources of the continuing pollution recorded in the Inny River upstream of Lough Sheelin in 2002. Downstream Q4 values recorded at most locations but slight pollution was also recorded at a number of sites.

- **River Brosna**: In 1999, 12 of 14 sites were polluted. The upper reaches were moderately polluted (Q3 and Q2). The river is generally slightly to moderately polluted along its length with the exception of upstream of Ferbane.

- **Little Brosna:** The river was mostly unsatisfactory in 2002 with only 3 of 13 sites satisfactory. According to the EPA this is due to eutrophication from suspected agriculture and more serious pollution from suspected sewage and other municipal discharges.

- **River Nenagh**: The upper reaches of the Nenagh River were unpolluted in 2002 with 6 sites having a Q4 or Q4-5 rating. However the downstream section was slightly polluted at 3 sites.

- **Camlin:** In 2002 the upper reaches were slightly polluted however water quality was then satisfactory to Longford. Downstream of Longford was moderately polluted to the Shannon.

- **River Suir**: The upstream sites were satisfactory in 2002, however due to either slight or moderate pollution in 2002. According the EPA the towns of Templemore, and Thurles are the major contributors to the pollution loading in the upper Suir.

- **River Barrow**: Eutrophication was widespread in 2001 particularly with serious pollution from Portlaoise, below Portarlington and from below Monasterevan to Athy. Deterioration was also considered to be due to Mountmellick sewage discharge and agricultural inputs upstream.

- **River Nore**: In 2001 the upper Nore (to Durrow) was mostly unsatisfactory with widespread eutrophication. This pollution was suspected by the EPA to be due to agriculture. Conditions improved to Q4 for 3 sites downstream to Kilbricken.

Source: Environmental Protection Agency (2002) "Water Quality in Ireland 1998-2000"

Loughs Ree, surface area 105km^2 and Lough Derg, surface area 117km^2 are the two main lakes in the Midlands. **Table 4.1** shows the pollution status of significant lakes in the region. Lough Lene in Westmeath is also a designated bathing area.

Table A2: Significant Lakes– Trophic Status from Period 1998 – 2000

Lake	Surface Area (km2)	Status
Lough Sheelin	18.8	Strongly/Highly Eutrophic
Lough Gowna	12.9	Strongly/Highly Eutrophic
Lough Kinale	2.4	Strongly/Highly Eutrophic
Lough Ree	105	Oligotrophic/Mesotrophic
Lough Ennell	14	Oligotrophic/Mesotrophic
Lough Derravaragh	11	Oligotrophic/Mesotrophic
Lough Owel	9.5	Oligotrophic/Mesotrophic
Lough Derg	8.79	Oligotrophic/Mesotrophic
Lough Lene	4.49	Oligotrophic/Mesotrophic

Source: Environmental Protection Agency (2002) "Water Quality in Ireland 1998-2000"

Drinking Water

Table A3: Groundwater Schemes in the Midlands Region

County	% of Total Water Supply	Public	Private
Longford	15	3	1831
Westmeath	20	2	13+
Offaly	72	36	23+
Laois	95	18	39+
Tipperary North	50	22	+

(Source: Geological Survey of Ireland) + Accounts for Unknown Private Residences

Table A4: Details of Water Schemes Monitored in 2002

Local Authority	Public Water Schemes		Group Water Schemes	
	No. of Supplies	% Compliance	No. of Supplies	% Compliance
Laois	20	98.8	12	96.8
Longford	8	95.5	41	89.5
North Tipperary	24	97.7	36	95.9
Offaly	23	97.8	20	97.5
Westmeath	12	95.4	2	85.7

(Source: EPA, Quality of Drinking Water in Ireland, A Report for the Year 2002)

However elevated nitrate levels were reported in Co. Laois and North Tipperary and problems with achieving aluminium levels were recorded in Co. Longford. Also incidents of faecal coliform

contamination were found to occur in all local authorities in either public or group schemes although the majority of these were moderate.

FLORA AND FAUNA

Table A5: Number of pNHAs, cSACs and SPAs in each County

County	No. of pNHAs	No. of cSACs	No. of SPAs
Offaly	48	14	3
Longford	19	5	1
Laois	25	6	
North Tipperary	35	12	1
Westmeath	32	14	6
Laois/Offaly	2	2	
Laois/Offaly/Westmeath	1		
North Tipperary/Laois	1		
North Tipperary/Offaly	2		1
North Tipperary/Offaly/Westmeath	1	1	1
Offaly/Westmeath	2		
Westmeath/Longford	3	1	3
Total	**171**	**55**	**16**

(Source: DoEHLG)

ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE

Table A6: Types of Monuments in the Midlands Area

Type of Monument	Laois	North Tipperary	Offaly	West Meath	Longford	Total Number of Monuments
pit	0	1	0	2	0	**3**
Artefact	109	173	157	105	64	**608**
Building	206	306	246	388	86	**1232**
Buried	69	18	62	51	11	**211**
Cairn	2	12	14	7	2	**37**
Cave	8	12	25	34	7	**86**
Earthwork	394	1143	467	2138	767	**4909**
Enclosure	339	784	427	55	291	**1896**
Extent	88	153	78	45	56	**420**

Linear	13	5	5	0	1	**24**
Megalith	7	28	0	2	7	**44**
Road	9	25	65	9	377	**485**
Undefined	39	143	200	22	16	**420**
Water	43	111	69	87	46	**356**
	6	2	8	2	0	**18**

(Source: DoEHLG database)

POPULATION

Table A7: Census Figures 1996-2002

County	1996	2002	Increase
Laois	52,945	58,774	11.0%
Longford	30,166	31,068	3.0%
Offaly	59,117	63,663	7.7%
N. Tipp	58,021	61,010	5.2%
Westmeath	63,314	71,858	13.5%
Total	**263,563**	**286,373**	**8.6%**

AIR QUALITY AND CLIMATE

Table A8: Mean Concentration of Key Air Pollutants in 2002

Key Air Pollutants	Zone C (population >15,000)	Zone D (population <15,000)	EU Limits Annual Average Limits S.I. 271 of 2002
Air Monitoring station	Drogheda	Kilkitt (Monaghan)	
SO_2	14 µg/m^3	5 µg/m^3	20 µg/m^3
NO_2	23 µg/m^3	3 µg/m^3	40 µg/m^3
PM_{10}	32 µg/m^3	NR	40 µg/m^3

Source: EPA (2003) Air Quality Monitoring-Annual Report 2002. NR = Not Recorded

Table A9: 30-year Average Meteorological Data from Birr (Annual Values)

Parameter	30-Year Average
Mean Temperature (^{0}C)	9.3
Mean Relative Humidity at 0900UTC (%)	85
Mean Daily Sunshine Duration (hours)	3.33
Mean Monthly Total Rainfall (mm)	804.2
Mean Wind Speed (knots)	7.0

APPENDIX B

RELATIONSHIP WITH OTHER RELEVANT PLANS AND PROGRAMMES

INTRODUCTION

The Midlands Waste Management Plan has been examined against other relevant Plans and Programmes that may influence or impact on the Plan. This is also to avoid conflict and to ensure the plan is consistent with other relevant policies. This includes plans in the same geographical area as well as plans in the same sector, i.e. plans and policies relating to waste.

RELEVANT INTERNATIONAL AND EUROPEAN POLICIES

Table B1: European Policies and Programmes

Policy	Summary
EU Habitats Directive (92/43/EEC)	The Directive lists habitats and species that must be given be protection in Special Areas of Conservation (SACs).
EU Birds Directive (79/409/EEC)	The Directive requires the designation of Special Protection Areas (SPAs). SAC's and SPA's form part of "Natural 2000" protected sites.
EU Water Framework Directive (2000/60/EC)	The directive aims to maintain "high status" of water where it exists, to prevent the deterioration in the status of any water and to achieve at least "good status" in all waters by 2015. The Directive requires the establishment environmental objectives and a programme of measures by a River Basin Management Plan.
EU Nitrates Directive (91/676/EEC)	This Directive aims to protect waters against pollution by nitrates, which is to be implemented by an action programme of measures.
European Convention on the Protection of the Archaeological Heritage (1992)	The Convention was ratified by Ireland in 1997, which requires that appropriate consideration be given to archaeological issues at all stages of the planning and development process.
European Landscape Convention (2000)	The Convention was ratified by Ireland in 2002, and it encourages public authorities to adopt policies at local, national and international level to protect and manage landscapes.
Agenda 21 (1992)	This action for sustainable development was drawn up at the UN Conference on Environment and Development in Rio de Janeiro in 1992. It aims to promote sustainable development at a local and regional level by taking into account environmental protection in the development process.
Kyoto Protocol (1997)	The UN Protocol is committed to take action to combat climate change. Under the protocol industrialised countries will have to reduce their combined greenhouse gas emissions by a minimum of 5% by 2012.
UN Convention on Biological Diversity (1992)	The Convention was ratified by Ireland in 1996, and it in response Ireland has prepared a Draft National Biodiversity Plan to reflect the requirements of the convention.
OSPAR Convention (1992)	The Convention was ratified by Ireland in 1997, which aims to protect the marine environment of the north-east Atlantic. This requires that measures be taken to prevent and eliminate pollution of the marine environment.
Convention for the Protection of the Architectural Heritage of Europe (1985) Granada Convention	This Convention was ratified by Ireland in 1997 and requires that measures are taken to identify and protect architectural heritage.

RELEVANT NATIONAL AND REGIONAL POLICIES

A list of National policies, plans, and programmes relevant to the Midlands Waste Plan is detailed below.

Table B2: List of Plans, Policies and Programmes Relevant to the Midlands Waste Plan

Relevant Plan, Policy or Programme	Objectives/ Policies relating to Waste Plan
National Spatial Strategy 2002-2020 (2002)	Roles of NSS include- - Support a better balance of activity and development between areas experiencing rapid development and congestion and areas that are economically under-utilised. - Guide Government Departments and agencies in formulating and implementing policies and public investment decisions which have a strong spatial dimension or which may otherwise be affected by spatial dimensions - Set a national context for spatial planning to inform regional planning guidelines and strategies and county and city development plans and strategies - Inform strategic investment, transport and other infrastructure policy decisions, for both the public and private sector *The Waste Management Plan has taken account of the Spatial Strategy and Regional Planning Guidelines.*
Sustainable Development: A Strategy for Ireland (1997)	Energy- Indicative national objective of limiting the growth in total emissions of CO_2, methane and nitrous oxide up to the year 2010 to 15% above their 1990 levels. Industry- Producer responsibility initiatives will be encouraged to increase reuse and recycling of wastes, with regulatory support to ensure fair competitive conditions for participating industries The extension of the EU Eco-management and Audit Scheme (EMAS) to all major industries will be actively promoted. Waste –the use of economic instruments will be explored to reduce waste, promote reuse/ recycling and increase management efficiency *The Waste Management Plan has as an objective to develop sustainable waste management technologies and services for the region.*
National Biodiversity Plan (2002) (www.environ.ie)	This Plan has been prepared in response to the UN Convention on Biological Diversity. It relates to conservation of biodiversity for the following: habitat diversity including all sites of special diversity importance, species diversity and genetic diversity. The overall objective is to secure the conservation, including where possible the enhancement, and sustainable use of biological diversity in Ireland and to contribute to conservation and sustainable use of biodiversity globally. *The Waste Management Plan includes siting criteria in relation to EU and National proposed, candidate and designated sites.*
National Heritage Plan (2002) (www.npws.ie)	The core objective is 'protecting our heritage' and this Plan forms the basis of a strategic approach to the protection and management of heritage up to 2007. Government Policy Statement "The conservation of our heritage, many forms of which are non- renewable, is essential for sustainable development and for maintaining the quality of human life. Due regard will be had to the 'polluter pays' principle and the precautionary principle". *The Waste Management Plan includes siting criteria in relation to designated sites (above) areas of high amenity or high archaeological interest (international, national or regional interest).*
National Climate Change Strategy (2000) (www.environ.ie)	Overall EU target under Kyoto Protocol is to reduce greenhouse gas emission by 2012 by 8% (from 1990 levels). Ireland has an emissions target of +13% on 1990 levels. This strategy provides a framework for achieving these reductions in emissions. Measures in the waste sector will be in accordance with the National Policy Framework

Relevant Plan, Policy or Programme	Objectives/ Policies relating to Waste Plan
	set out in Changing Our Ways. Waste generators will pay the full cost of waste collection, treatment and disposal including the development of charges for household and commercial waste.
National Development Plan (NDP) 2000 – 2006 (1999) (www.ndp.ie)	The NDP is designed to achieve a more balanced regional development in Ireland. This is in order to reduce the disparities between and within the two Regions (Border, Midlands and West and South and East). Specific objectives include sustainable economic growth, balanced regional development and social inclusion. *There is no conflict with the Waste Management Plan.*
Managing Ireland's Rivers and Lakes: A Catchment based Strategy Against Pollution (1997)	This document detailed a strategy to protect water quality against pollution by phosphorus from all sources.
River Basin Management Plans for the Shannon, Eastern and South Eastern River Basin Districts (RBD's) (www.wfdireland.ie)	The overall objective of river basin projects is to establish an integrated monitoring and management system for all waters within an RBD, to develop a dynamic programme of management measures and to produce a River Basin Management Plan, which will be continually updated. The River Basin Management Plans are currently in preparation and may be subject to SEA in the future.
Framework and Principles for the Protection of the Archaeological Heritage (1999) (www.environ.ie)	This document sets out the archaeological policies and principles which should be applied by all public bodies when undertaking or authorising development. *The Waste Management Plan includes siting criteria in relation to designated sites (above) areas of high amenity or high archaeological interest (international, national or regional interest).*
Policy Paper on Ireland's Landscape and the National Heritage, The Heritage Council, 2002	The policy paper sets out a vision for the Irish landscape to allow people to harness the landscape for economic benefit whilst acknowledging that in the long run such benefits can only be sustained through an appreciation and awareness of the contribution of that landscape to our quality of life. *The Waste Management Plan includes siting criteria in relation to designated sites (above) areas of high amenity or high archaeological interest (international, national or regional interest).*
Green Paper on Sustainable Energy (1999)	The Green Paper indicates how Ireland will progress towards meeting its energy requirements in an environmentally and economically sustainable way. It concentrates on Ireland's need to limit energy-related CO_2 emissions under the international Kyoto Protocol. *The Waste Management Plan*

National Waste Policy documents include the following, which have been taken into account in the Waste Plan:

- Changing Our Ways (1998) (www.environ.ie)
- Waste Management - Taking Stock and Moving Forward (2004) (www.environ.ie)
- National Overview of Waste Management Plans (2004)
- Delivering Change - Recycling and Preventing Waste (2002)

- Draft National Strategy for Biodegradable Waste (2004)

RELEVANT PLANS/ POLICIES ON A COUNTY LEVEL

Other Local Authority Plans and Programmes include:

- County Development Plans (Offaly Co. Co, Laois Co.Co., Westmeath Co. Co., Longford Co. Co., North Tipp)
- County Heritage Plans (Westmeath, Longford, Laois, Offaly, Nth Tipp) – See Objectives for National Heritage Plan
- Local Biodiversity Action Plan for each county (incorporated into the County Heritage Plan) – See Objectives for National Biodiversity Plan
- Groundwater Protection Schemes
- Sludge Management Plans

The Regional approach to waste management, promoted in Changing Our Ways has seen 8 regional groupings in the country, with two individual Local Authorities producing their own Waste Management Plans.

Table B3: Waste Management Planning in Other Areas of Ireland

Region	Local Authorities Included
Connaught	Mayo, Sligo, Roscommon, Leitrim, Galway Co. Co. & Corporation.
Cork	Cork City and County
Dublin	Dublin City Council, Dun-Laoghaire Rathdown, Fingal, South Dublin
Kildare	Independent Waste Plan
Mid West	Limerick (Co. Co. & Corporation), Kerry, Clare.
North East	Meath, Louth, Cavan, Monaghan
South East	Wexford, Carlow, Kilkenny, South Tipperary, Waterford Corporation & Co. Co.
Wicklow	Independent Waste Plan
Donegal	Independent Waste Plan

APPENDIX C

COMPATIBILITY OF ENVIRONMENTAL OBJECTIVES

Table C1: Compatibility Matrix for Environmental Objectives

A	Limit adverse impacts on biodiversity, flora and fauna	**A**														
B	Limit water pollution to levels that do not adversely damage the environment	✓	**B**													
C	Limit air pollution (incl. noise, odour) to levels that do not adversely damage the environment	✓	0	**C**												
D	Reduce greenhouse gas emissions	0	0	✓	**D**											
E	Reduce vulnerability to climate change, e.g. flooding	X?	X?	0	✓	**E**										
F	Limit the use of good quality agricultural land	✓	0	0	0	✓X	**F**									
G	Limit the impact on soil quality and quantity	✓	0	✓?	0	✓X	✓X	**G**								
H	Return land released from ceased waste management activities to beneficial use	✓	✓	0	0	✓	0	✓	**H**							
I	Minimise impact on sites of cultural heritage including architectural and archaeological heritage	0	0	✓?	0	✓	0	0	✓0	**I**						
J	Protect and enhance the landscape	✓	✓	0?	0/?	✓X	✓X	✓	✓	✓	**J**					
K	Maximise use of existing material assets	0	0	✓?	0	✓	✓X	0	✓0	0	✓	**K**				
L	Protect and enhance human health	0	✓	✓	0?	✓	?X	✓	✓	0	✓	0	**L**			
M	Maximise the use of renewable energy sources	0	0	0	✓	0	0	0	0	0	✓	0	0	**M**		
N	Minimise impact of transport associated with waste	✓	0	✓	✓	✓	✓X	✓	0	✓	✓	✓X	✓	0	**N**	
O	Consider use of alternatives to road transport including rail	X?	✓X	✓?	✓	0	?	?	0	?	?	✓X	✓X	0	?	**O**

Key

✓	compatible
0	no effect
X	may conflict
?	uncertain effect

Notes on Table C1

A. Limiting adverse impacts on biodiversity, flora and fauna

A/B would be compatible with limiting air pollution, as both would be beneficial to each other.
A/C would be compatible with limiting water pollution, as both would be beneficial to each other.
A/E may conflict with reducing vulnerability to climate change if areas were set aside for flood control, etc. but the effect is uncertain at present.
A/F may conflict with limiting the use of good quality agricultural land, as could lead to site selection towards non-agricultural land which may be more diverse.
A/G would be compatible with limiting the impact on soil as the biodiversity of the soil would be maintained.
A/H would be compatible with returning used land to beneficial use, which would provide opportunities for increased biodiversity.
A/J would also be compatible with maintaining the landscape.
A/N would be compatible with minimising transport associated with waste, which would reduce the threat to biodiversity.

B. Limiting water pollution

B/E may conflict with reducing vulnerability to climate change if water flow is being controlled or water is being impounded could reduce flow and cause problems of pollution. The interactive effect of these objectives may also be uncertain, for example, abstraction of water could reduce or increase vulnerability to climate change.
B/H would be compatible with returning land to beneficial use after ceased waste management activity as the risk of lechate is less.
B/J would be compatible with landscape protection due to less risk of algal blooms, for instance.
B/L would be compatible with protecting human health as there would be less risk from contaminated water.
B/O could be compatible with the use of alternatives to road transport depending on the mode chosen or could promote water pollution if waterways were used.

C. Limiting air pollution

C/D such as O_3 would be compatible with reducing GHG.
C/G such as acidifying compounds soil quality would be maintained but the effect is uncertain at present.
C/I such as acidifying compounds would mean less damage to stone structures but the effect is uncertain.
C/J such as O_3, SO_2, etc. would promote less damage to vegetation and the landscape, but the exact effect is uncertain at present.
C/K by maximising the use of material assets could provide a reduction in air pollution, but the effect is uncertain.
C/L would be compatible with protecting human health, especially for asthma sufferers, etc.
C/N would be compatible with minimising transport which would lead to less air pollution in return.
C/O would be compatible with the use of alternatives to road transport but the effect is uncertain.

D. Reducing GHG emissions

D/E would be compatible with reducing vulnerability to climate change.
D/J could be compatible with protecting the landscape due to less damage by ozone, but the effect is uncertain.
D/L such as O_3 could result in enhanced human health but the effect is uncertain.
D/M would be compatible with the increased use of renewable energy sources.
D/N would result from a reduction in transport associated with waste.
D/O would result from the use of alternatives to road transport, such as rail.

E. Reducing vulnerability to climate change

E/F could be compatible with maintaining good quality land by providing protection or may conflict is land is required for buffering zones.

E/G would be compatible with reducing the impact on soil quality and quantity due to a reduction in the risk of flooding etc.
E/I would be compatible with preserving cultural heritage by reducing the risk of damage due to flooding and extreme weather events.
E/J could be compatible with protecting the landscape by providing protection against extreme weather events but construction of flood barriers may obscure the landscape.
E/K would mean material assets would be less at risk from extreme weather events or flooding.
E/L would mean human health would be less vulnerable to damage caused by extreme weather conditions.
E/N would mean that transport will be less at risk from disruption due to extreme weather.

F. Limiting the use of good quality agricultural land

F/G would mean the impact on soil could be reduced in some areas and increased in others on less valuable land.
F/J parts of the landscape would be protected (and opportunities for enhancement provided) and whereas other areas would be impacted.
F/K would mean some material assets would be protected whereas others, on less valuable land may be at risk.
F/L would mean human health may not be affected but if pressure was placed on less valuable land close to residential sites there may be some impact, but it is uncertain at present.
F/N could impact positively or negatively on transport associated with waste, depending on the location of the facility in relation to the land in question.
F/O could impact positively or negatively on transport mode associated with waste, depending on the location of the facility in relation to the land in question.

G. Limiting the impact on soil

G/H would be compatible with returning land from previous waste sites to beneficial use.
G/J would mean the landscape would be protected due to less contamination.
G/L would mean that human health would be less at risk from contamination.
G/N would be compatible with minimising transport associated with waste (less pressure on the soil resource).
G/O using alternatives to road transport will be uncertain and dependent on the mode of transport chosen.

H. Returning land to beneficial use after waste management activity

H/I would mean less pressure would be placed on sites of cultural heritage as more land becomes available.
H/J would mean that the landscape would be enhanced as the derelict sites would be transformed to a useful site.
H/K would be compatible with maximising the use of material assets if a site could be transformed and put to another use.
H/L would be compatible with protecting and enhancing human health due to less risk of contamination and/or creation of green space.

I. Minimising the impact on sites of cultural heritage

I/J would mean that the landscape would be protected and there may also be opportunities for landscape enhancement.
I/N would be compatible with minimising transport associated with waste due to less pollution and physical impact from vehicles.
I/O it is uncertain what effect this might have on alternatives to road transportation.

J. Protecting the landscape

J/K would be compatible with maximising the use of material assets by reusing existing buildings and infrastructure.
J/L would mean human health could be enhanced if more green areas were created.
J/M would be compatible with maximising the use of renewable energy, which creates less pressure from pollution/GHG emissions.

J/N would be compatible with minimising transport associated with waste as less pollution/GHG emissions would result.
J/O may have uncertain effects on alternatives to road transport.

K. Maximising the use of material assets

K/N would be compatible with minimising the transport associated with waste if existing assets could be reused or may conflict if the infrastructure network needed to be extended.
K/N may be compatible or may conflict with selecting alternatives to road transport depending on the mode chosen.

L. Protecting human health

L/N would be compatible with minimising transport associated with waste due to less risk of accidents, pollution etc.
L/O may be compatible or may conflict with selecting alternatives to road transport depending on the mode chosen.

N. Minimising the impact of transport associated with waste.

N/O would have uncertain effects on selecting alternatives to road transport.